

ROYAL BOTANIC GARDENS, KEW.

BULLETIN
OF
MISCELLANEOUS INFORMATION.

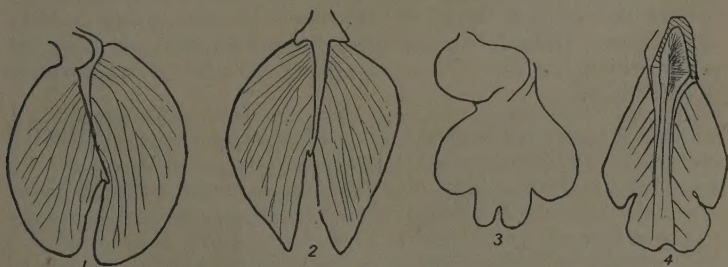
No. 9]

[1925

XLVI.—THE GENUS *BRACHYCORYTHIS*.

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In 1921 Dr. Rudolf Schlechter published a monograph of the genus *Brachycorythis** and the allied genera which did much to clear up the difficulties surrounding the various species. Recent additions to the genus at Kew have necessitated a complete re-examination of the material and the appearance of Schlechter's helpful work made this task comparatively simple. In the present paper some modifications of Schlechter's observations on *B. pleistophylla* Rehb. f. are given, his remarks regarding *B. congoensis* Krzl. are amplified, and two new species and several new varieties are described. It is not necessary to discuss the distinctions between *Brachycorythis* and the allied genera, which Schlechter has done so fully in the paper cited.



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| 1. <i>B. pleistophylla</i> Rehb. f. | 3. <i>B. Macclouniei</i> Braid. |
| 2. <i>B. congoensis</i> Krzl. | 4. <i>B. Hirschbergii</i> Braid. |

The first species of *Brachycorythis* (*B. ovata*) was described by Lindley in 1838, from South Africa. In 1882 Reichenbach added 7 species. In 1910 the number had risen to 21, and others have since been added. Reichenbach did not adhere rigidly to the limits laid down by Lindley, particularly in linking the

* Beihefte Bot. Centralbl. xxxviii., 2, 80—Revision von *Schizochilus* Sond. und *Brachycorythis* Lindl.

genus *Schizochilus* with *Brachycorythis*. Bentham in the *Genera Plantarum* recognised both these genera, which he placed in the group *Diseae*, and later Pfitzer accepted this arrangement. About the close of the last century Schlechter came to the conclusion that the genus was a close ally of *Gymnadenia*—i.e. a member of his group *Plantanthereae* of the sub-tribe *Habenariae*. His opinion is deserving of special weight as he has actually studied the group in the living state, and all who have worked with these plants realise how inadequate dried specimens are. Rolfe in the *Flora of Tropical Africa* (1898) kept the genus in the sub-tribe *Habenariae* and separated the distinctly spurred species into *Plantanthera*. In 1901 Kraenzlin in his *Genera et Species Orchidacearum* retained the genus *Brachycorythis*, but united *Schizochilus* with *Gymnadenia*. In 1913 Rolfe in the *Flora Capensis* again placed *Brachycorythis* beside *Plantanthera* and added *Schizochilus*—a genus confined practically to South Africa.

During the past 50 years therefore there have been three different conceptions of *Brachycorythis* and considerable misunderstanding has resulted. In general terms we have Schlechter's conception based on the structure of the rostellum, the partial union of the petals to the column, the length of the column and the characteristic sack-like hypochile. This appears to be more complete and clearly defined than Rolfe's nebulous idea based on the characteristic habit, the structure of the sack-like hypochile and the absence of a spur, or Kraenzlin's wider idea of general habit. At the same time it must be admitted that the habit as expressed in the shape and arrangement of the leaves, which pass gradually into bracts, and the general appearance of the flower is typical of *Brachycorythis* and its close allies. Indeed, it is the recognition and description of the latter which has made it necessary to examine *Brachycorythis* in such detail.

Schwartzkopffia—a genus into which two species hitherto recognised as *Brachycorythis* fall naturally—was described by Kraenzlin in 1900. Two other genera, *Diplacorchis* and *Gyaladenia*, described by Schlechter absorb the other aberrant members of the sub-group which used to be included under *Brachycorythis*, but which Schlechter maintains are more nearly related to *Orchis* and *Gymnadenia* respectively. For comparison, a complete list of the arrangement as proposed by Schlechter is appended, but modified according to this paper.

Brachycorythis is confined to Africa and Madagascar: one species is found in Madagascar and may be restricted to that island and four species are found in South Africa.

Schlechter calls attention to the following points (l.c. pp. 102-3). The species are habitually characterised by the exceptionally luxuriant leafage of the stems, this being continued right up to the tip of the inflorescence so that the lower bracts

exceed the flowers. The positions of the sepals are suggestive of *Orchis*; in some cases they are bent together, in others thrown backwards and sometimes the dorsal one is the smallest. The petals stand erect, never joined to the dorsal sepal, but always to the columns where the union is by the posterior basal rim and extends fairly high up the column. The lip is characterised by the development of the hypochile. This is usually semi-spherical, more rarely semi-elliptical, and distinctly constricted towards the lip plate and with the edges converging towards the middle of the base of the plate like two keels uniting in front. The hypochile may contain one or more protuberances more or less wart-free. The shape of the lip plate is very variable. There are three main types of shape: the simple, scarcely lobed, convex plate with edges sharply reflexed; the two-lobed plate again with sides bent down sharply; and the flat three-lobed plate. The change from one type to another is so gradual that in Schlechter's opinion the shape of the lip cannot be used for the divisions into species. The column is remarkable on account of its length, the elongation having taken place below the stigma.

Schlechter divides the genera into the four following sections:—

- 1.—**Dasycorythis**, with thick short, velvet-like hairy leaves and flowers.
- 2.—**Microcorythis**, with smooth small flowers, with the lip plate flat and almost equally 3-lobed.
- 3.—**Eubrachycorythis**, with smooth medium-sized flowers, lip plate convex and unmistakably 3-lobed or undivided with short stumpy points; the two halves of lip plate are sharply deflexed.
- 4.—**Calocorythis**, with smooth generally large-flowered kinds, where the lip plate, extending markedly beyond the sepals, is drawn out into two large more or less sickle-formed side lobes, both of which bend downwards sharply, the central lobe being small or absent.

Section 1.—**Dasycorythis** he divides into seven species. The original member of this section was the South African plant *B. pubescens* Harv., and personally I feel the distinctions are so finely drawn between the species that it is impossible to identify them except by direct comparison with the types. The points of comparison chosen are the relative lengths and widths of the lip, comparisons in lengths of the middle lobes, in the breadth and shape of the lateral lobes, between hairy and glabrous petals, lax and dense racemes and in minute differences in length of the sepals. The species which fall into this section are *B. velutina* Schltr., *B. pubescens* Harv., *B. hispidula* (Rendle) Schltr., *B. Baumii* Schltr., *B. Stolzii* Schltr., *B. Kassneriana*

Krzt., *B. sudanica* Schltr. Several of these appear to me to be merely geographical forms.

Section 2.—Microcorythis contains three small-flowered species: *B. inhambanensis* Schltr., *B. Briartiana* Krzt., and *B. Buchananii* (Schltr.) Rolfe. Of these I know only the last, which is synonymous with *B. parviflora* Rolfe, and it is open to question whether or not the limits to species are drawn so finely that the distinctions are lost when expressed in words.

Section 3.—Eubrachycorythis according to Schlechter contains four species, but *B. congoensis* Krzt. and a new species described in this paper, *B. Hirschbergii* Braid, come in here also. Two species occur in South Africa—*B. ovata* Lindl. and *B. Allisoni* Rolfe; these are distinguished by the lip being distinctly longer than the sepals. In *B. congoensis* Krzt. also the lip is longer than the sepals, but in the other three cases it is practically of equal length. *B. angolensis* Schltr. is a close ally of *B. congoensis* as is also the new species *B. Hirschbergii*. *B. sceptrum* Schltr. is a larger, not dissimilar, type of plant. Unfortunately neither the latter nor *B. angolensis* is represented at Kew.

Section 4.—Calocorythis contains nine species—all striking and handsome plants. Schlechter following Rolfe assumes that plants always dry to the same colours, and on this he subdivides the species within the section. Two species he separates out because the whole plant, flowers, leaves and bracts, dries black. So much depends on the treatment to which the plants have been subjected and the degree of "blackness" attained that this means of distinction seems unsound.

B. pulchra Schltr. and *B. Leopoldi* Krzt. are separated out because they possess no apical tooth between the lobes, but even in the type specimen there is a tiny tooth in some cases. The leaves of these plants are said to dry black, but the flowers dry a bright brown. This is the case in the species *B. Leopoldi*, but with *B. pulchra* the colour of the dried flowers is a blackish-brown. Of the remaining five which do not dry black, four possess short lips (c. 1.25 cm.), one with acute lateral lobes (*B. acutiloba* Rendle) and two with obtuse lateral lip lobes. Of these, *B. Welwitschii* Rehb. f. has crenulate lateral lobes to the lip and in *B. grandis* Krzt. the lobes are sub-entire but short and twisted. *B. Schweinfurthii* Rehb. f. differs in the possession of obliquely oblong, obtuse petals. The handsome *B. Kalbreyeri* Rehb. f. has a longer lip (c. 2.5 cm.) and is a daintier and more handsome plant, though not so robust as *B. Schweinfurthii*.

The two plants which dry black given by Schlechter are *B. pleistophylla* Rehb. f. and *B. Perrierii* Schltr. An excerpt from the Key (l. c. pp. 107) illustrates how they were separated:

B. Tooth or apical lobe between the lateral lobes in the apex of labellum.

1. Plants drying black all over (i.e. flowers included); base of petals obliquely cuneate, apex recurved.

(a) Lateral lobes of lips acute, *B. pleistophylla* Rehb. f.

(b) Lateral lobes of lip somewhat obtuse, *B. Perrierii* Schltr.

Unfortunately Schlechter had not examined the type of *B. pleistophylla* Rehb. f. (which is at Kew), for the lobes of the lip are, as Reichenbach described, obtuse. I have not seen the Madagascar species *B. Perrierii*, but it is certainly very close to *B. pleistophylla* if not identical with it. The plant which Schlechter has mistaken for *B. pleistophylla* is represented at Kew by only one specimen. This was collected by Mr. McClounie on Milanje in the Shire Highlands and is described below as *B. Macclouniei* Braid, sp. nov.

After careful examination of the dissections of flowers from herbarium material of undoubtedly the same species, I have been greatly impressed by the differences of the shapes of sepals and petals, and I feel convinced that these alone are of little value as characters of specific importance in dried specimens of this genus; moreover the species of this genus are so variable that to regard all the variants as distinct species only complicates matters unnecessarily.

Brachycorythis Macclouniei Braid sp. nov.; *B. pleistophyllae* Rehb. f. affinis, sed labello longo angusto ovato acuto lobato, petalis sepalisque latioribus et brevioribus differt.

Herbs, very leafy. *Roots* short (6–7 cm.) and thick (0.75 cm.), velamen covered. *Stem* about 40 cm. high, richly clothed with leaves which pass gradually into bracts. *Leaves*, lower almost sheath-like, with the largest sheathing below, 5–6 cm. long, 0.75 cm. wide, lanceolate, aristate-acuminate, the long fine points frequently being bent or twisted, venation distinct as corrugations. *Lowest bracts* about 2 cm. long, 0.3 cm. broad and exceeding the flowers; upper bracts rather smaller. *Ovary* 1.2 cm. long, ridges verrucose. *Sepals*, dorsal 0.6 cm. long, 0.4 cm. wide, oblong, semi-acute; lateral 0.6 cm. long, 0.3 cm. wide, obliquely semi-ovate, obtuse, keeled at tip. *Petals* 0.6 cm. long, 0.4 cm. wide, almost quadrate. *Lip* 1 cm. long, 0.6 cm. wide, ovate in general outline when flattened out, sinus extending to nearly half the length of lip, intermediate lobe in sinus small (1 mm.) triangular, lateral lobes attenuated to blunt points, hypochile slightly pouched, wings of pouch extending down centre of lip.—*B. pleistophylla* Schlechter in Beihefte Bot. Centralbl. xxxviii. (1921) 2, 117, not of Rehb. f.

NYASALAND. Mt. Milanje, 7000 ft., fl. Oct. 1895, *McClounie*.

It is difficult to ascertain the true shape of the petals and sepals from dry specimens; moreover they appear to be distinctly variable, but those in the present species are shorter and broader than those of *B. pleistophylla* Rehb. f. The lip is

quite distinctive. That of *B. pleistophylla* is almost circular when opened out flat, but in *B. Macclouniei* it is narrowly ovate. In both cases the insides of the perianth-segments are covered with minute raised ridges (probably the remains of dried up pustules) which make them appear as if covered with a spider's web. The leaves in the type specimen have dried quite black and the flowers a blackish brown.

Brachycorythis pleistophylla Reh. f.—*B. pulchra* Schltr. in Beihefte Bot. Centralbl. xxxviii (1921) 2, 116.

In his enumeration under *B. pleistophylla*, Schlechter did not cite all the specimens from Nyasaland enumerated in the Flora of Tropical Africa because, he said, *B. pulchra* Schltr. is so easily confused with *B. pleistophylla* in the dry state. With this remark I quite agree, for even in the type of *B. pulchra* Schltr. there is in some cases a tiny tooth between the lateral lobes, and the flowers of the Nyasaland specimens of *B. pleistophylla* Reh. f. have dried only a dull brownish black. In my opinion *B. pulchra* is nothing but *B. pleistophylla* Reh. f.

Brachycorythis Hirschbergii Braid sp. nov.; *B. congoensis* Krzl, affinis, sed labello longo angusto, labelli lobis lateralibus acutis, petalis angustis et foliis nonnumquam confertis differt.

Herb about 30 cm. high, glabrous below, glandular or verrucose above. *Leaves* 5 cm. long, 1.2 cm. broad, lanceolate, acuminate, sheathing only at point of attachment, passing gradually into bracts, nerves about 5, midrib prominent. *Bracts* 2.5 cm. long, 0.5 cm. wide, decreasing in length; slightly longer than the flowers. *Ovary* 1–1.2 cm. long, verrucose. *Sepals*, dorsal 0.6 cm. long, 0.3 cm. broad, ovate, semi-acute, concave; lateral 0.7 cm. long, 0.4 cm. wide; obliquely oblong, obtuse and hooded at tip. *Petals* 0.6 cm. long, 0.2 cm. wide obliquely linear, unequally and shallowly retuse near tip. *Lip* 0.7 cm. long, 0.4 cm. broad, obovate in general outline, 3-lobed; lateral lobes sickle-shaped, folded downwards, obtuse, anterior lobe exceeding side lobes, somewhat broadly irregularly obcordate, sometimes with a small tooth in sinus; wings of pouch prolonged into wavy medial keel, becoming thinner towards apex, cup of hypochile distinctly sack-like, widely conical, 2 mm. deep.

BELGIAN CONGO. Katanga, C. W. O. Hirschberg 134. "Sepals bright purple outside, inside white with green at the tip. Petals white with mauve markings, lip white and purple, very common. Fl. 25th Nov., 1923."

At first sight this plant comes very close to *B. congoensis* Krzl. The type, however, is sparsely leaved; the leaves have dried a greenish brown, the flowers brownish with a purple lip, and the structure of the lip is quite distinct.

Brachycorythis congoensis Krzl. Orch. Gen. et Spec. 1 (1900), p. 544.

B. congoensis Krzl. as represented by the type is in a poor state. The leaves are crowded and dry black, recalling *B. pleistophylla*, but they do not appear to be so markedly aristate. The plant looks as if it had been pressed while wet, and the parts of the flower do not show up clearly, and the dark colour seems abnormal. The lip apparently was much rounded—the lateral lobes being almost semi-circular—the apical lobe is somewhat narrowly rectangular and distinctly retuse at the tip. Like *B. Hirschbergii* there is a distinctly sack-like conical depression in the hypochile, in other words this is shorter and deeper than usual, and indeed suggests a connecting link with the genus *Diplacorchis*.

Brachycorythis grandis Krzl. var. **sudanensis** Braid, var. nov.; a typo foliis inferne brevioribus angustioribus, inflorescentia longiore brevior et petalis angustioribus differt.

SUDAN. Lado, *F. Sillitoe* 143 (type) and 144.

In this case the lowest leaves are less broad and less distinctly sheathing, the bracts are not so well developed; the flower heads are more elongated; the petals less broad at the base and with the apex usually obtuse, but sometimes somewhat pointed. The whole plant dries a darker colour than the type of *B. grandis*. The colour of the flowers ranges from a very pale pink to purple.

var. **ugandensis** Braid, var. nov.; a typo foliis et vaginis minoribus, sinu inter lobos labelli profundo et una dorsa carina et lineis duabus in sacco hypochilii differt.

UGANDA. Mt. Elgon, 4000 ft., *J. D. Snowden* 877.

This variety approaches *B. Schweinfurthii*. The basal leaves are not so large nor as markedly sheathed as in *B. grandis*. The sinus is almost $\frac{1}{3}$ of the total blade of the lip, and the side lobes are more strongly incurved than even in the latter and when dried flat the anterior parts of these lobes turn up at right angles to the blade. In the pouch of the hypochile there is one posterior keel and two lines.

Snowden remarks that the plant attains a height of 3 ft. and the flower is heliotrope to almost white in parts; the sepals are heliotrope, paler towards column, which is pale heliotrope to white as is also the anther; the pollinia are dark grey.

Brachycorythis Schweinfurthii Rehb. f. var. **nigerica** Braid, var. nov.; a typo ovario glanduloso, carinis duabus in hypochilio et labelli sinu brevior differt.

NIGERIA. Kano Hills, Liruwen, *Carpenter*; Abinse and vicinity, *Dalziel* 836 (type); Zungeru, *Dalziel* 561; Zungeru and Lokoja, *Lugard*.

This is a handsome plant and exhibits much diversity in the shapes of the floral parts, the glandular ovary, the shallow sinus, and the two keels in the pouch distinguishing it from *Reichenbach's* type. In my opinion *B. grandis* and *B. Schwein-*

furthii are very closely allied, and their varieties merge into each other.

Brachycorythis Kalbreyeri *Rchb. f. var. glandulosa* Braid, var. nov.; a typo caule et vagina inferne glandulosa et foliis latioribus differt.

SIERRA LEONE. Makump, N. W. Thomas 894 (type); Heddles farm, Lane-Poole 276; Waia, Dawe 489.

This variety of the most beautiful of all *Brachycorythis* species differs from the Cameroon type only in possessing slightly broader leaves and by the stem and leaf-sheath of the lower parts of the plant being glandular.

The writer wishes to express his thanks to Dr. De Wildeman of Brussels for the loan of the type of *Brachycorythis congoensis* Krzl. and to the authorities of the Botanische Abteilung des Naturhistorischen Museums, Wien, and the Botanisches Museum, Berlin, for the loan of other type specimens.

List of all species described under *Brachycorythis* with synonymy. The numbers in brackets refer to Schlechter's monograph; those without numbers are mentioned in this paper.

acutiloba Rendle (19).

Allisoni Rolfe (14).

angolensis Schltr. (11).

Baumii Schltr. (4).

Briartiana Krzl. (9).

Buchananii (Schltr.) Rolfe (10).

Bulbinella Rchb.=*Schizochilus Bulbinella* (Rchb. f.) Bol. *congoensis* Krzl.

disoides Krzl.=*Diplacorchis disoides* Schltr.

Engleriana Krzl.=*Diplacorchis Engleriana* Schltr.

Gerrardi Rchb. f.=*Schizochilus Gerrardi* (Rchb. f.) Bol.

Goetziana Krzl.=*B. hispidula* (Rendle) Schltr. (3).

grandis Krzl. (21).

grandis Krzl. var. *sudanensis* Braid.

grandis Krzl. var. *ugandensis* Braid.

Hirschbergii Braid.

hispidula (Rendle) Schltr. (3).

inhambanensis Schltr. (8).

Junodiana Krzl.=*Neobolusia Junodiana* Schltr.

Kalbreyeri Rchb. f. (23).

Kalbreyeri Rchb. f. (23) var. *glandulosa* Braid.

Kassneriana Krzl. (6).

Lastii (Rolfe) Schltr.=*Schwartzkopffia Lastii* Schltr.

Leopoldi Krzl. (16).

Macclouniei Braid.

oligophylla Krzl.=*B. angolensis* Schltr. (11).

ovata Ldl. (13).

Mac-Owaniana Krzl.=*Gyaladenia Macowaniana* Schltr.

parviflora Rolfe=*B. Buchananii* (Schltr.) Rolfe (10).

- Perrierii* Schltr. (18).
pleistophylla Rehb. f. (17).
pubescens Harv. (2).
pulchra Schltr. (15) = *B. pleistophylla* Rehb. f.
pumilio Rehb. f. = *Schwartzkopffia angolensis* Schltr.
rhomboglossa Krzl. = *Diplacorchis rhomboglossa* Schltr.
rosea Cheval. ?
sceptrum Schltr. (12).
Schweinfurthii Rehb. f. (22).
Schweinfurthii Rehb. f. (22) var. *nigerica* Braid.
sibganensis Krzl. = *Diplacorchis Engleriana* (Kr.) Schltr.
Soyauxiana Krzl. = *Diplacorchis Engleriana* (Kr.) Schltr.
Stolzii Schltr. (5).
sudanica Schltr. (7).
tenuior Rehb. f. = *Diplacorchis tenuior* Schltr.
Tysoni Bolus = *Neobolusia Tysoni* Schltr.
velutina Schltr. (1).
virginica (Bol.) Rolfe = *Neobolusia virginica* Schltr.
Welwitschii Rehb. (20).
Zeyheri Sond. = *Schizochilus Zeyheri* Sond.

XLVII.—DIAGNOSES AFRICANAE: LXXIX.

1701. *Clematopsis lineariloba* *Hutchinson et Summerhayes* [Ranunculaceae]; inter omnes species foliolis late linearibus valde distincta.

Caules e rhizomate lignoso erecti, usque ad 0.75 m. alti, profunde sulcati, medio circiter 2 mm. crassi, sparse pilosi, nodis fulvo-villosis, internodiis 5–19 cm. longis. *Folia* opposita, pinnata, usque ad 22 cm. longa, foliolis linearibus petiolulatis pinnatifidis terminale usque ad 15 cm. longo lateralibus brevioribus subcoriaceis glabris vel inferne sparse pilosis; rhachis sulcata, pilosa. *Flores* solitarii, terminales, circiter 3.5 cm. diametro, nutantes, longissime (ad 33 cm.) pedicellati; pedicelli apicem versus fulvo-tomentosi. *Sepala* 4, ovata vel lanceolato-ovata, acuminata vel apiculata, 2 cm. longa, 8–12 mm. lata, extra fulvo-tomentosa demum glabrescentia, margine pallidiora, intra dense et molliter albido-tomentosa. *Stamina* numerosa, filamentis complanatis pilosis 6 mm. longis; antherae 4 mm. longae. *Carpella* ambitu anguste lanceolata, sericeo-pilosa, stylo circiter 5 mm. longo coronata. *Achaenia* dense villosa, matura non visa.

TROPICAL AFRICA. Tanganyika Territory: Usafwa, 1800 m., in open forest, Dec. 1913, *A. Stolz* 2385.

1702. *Clematopsis simplicifolia* *Hutchinson et Summerhayes* [Ranunculaceae]; inter omnes species foliis simplicibus valde distincta.

Caules e rhizomate lignoso erecti, usque ad 0.5 m. alti, profunde sulcati, medio circiter 4 mm. crassi, pilis flavis plus

minusve retrorsis induti, internodiis usque ad 10 cm. longis. *Folia* opposita, simplicia, subsessilia vel breviter petiolata, ovata vel ovato-elliptica, usque ad 9 cm. longa, 5 cm. lata, basi rotundata vel subcuneata, apice obtusa ad acuminata, margine grosse et irregulariter dentata vel fere lobata, supra sparse pilosa, infra flavo-tomentosa ad glabrescentia nervis pilosis exceptis; nervi infra omnes valde prominentes; costa tenuis; nervi laterales reticulati. *Flores* solitarii, terminales vel rarius in axillis foliorum superiorum, 6–12 cm. diametro, nutantes, breviter vel longe (ad 17 cm.) pedicellati, pedicellis subdense vel dense flavo-tomentosis. *Sepala* 4–5, oblongo-ovata vel elliptico-ovata, apice plus minusve caudata, 3–6 cm. longa, 1.5–2.5 cm. lata, 7-nervia, utrinque subdense et molliter tomentella. *Stamina* numerosa, filamentis complanatis superne glabris inferne pilosis 1 cm. longis; antherae 5 mm. longae. *Carpella* ovoidea, sericeo-pilosa, stylo subdense plumoso usque ad 1.5 cm. longo coronata. *Infructescentia* circiter 6 cm. diametro. *Achaenia* anguste ellipsoideo-obovoidea, 5 mm. longa, inferne appresse pilosa, superne subdense pilosa, stylo circiter 2.5 cm. longo pallide flavo-plumoso coronata.

TROPICAL AFRICA. Tanganyika Territory: Rungwe Stock, 2800 m. in the crater among stones, Feb. 1914, *A. Stolz* 2514 (type); mountains East of Lake Nyasa, Apr. 1884, *W. P. Johnson*.

1703. *Cissampelos insignis* *Alston* [Menispermaceae]; ad *C. mucronatam* *A. Rich.* maxime accedit, sed forma foliorum et structura indumenti inter omnes species africanæ distincta.

Frutex scandens; ramuli teretes, sulcati, longe pilosi. *Folia* ovato-deltoidæa, basim versus peltata, basi truncata vel subcordata, apice longe mucronata, circiter 10.5 cm. longa, 7.5 cm. lata, margine integra et dense pilosa, supra demum subglabra, infra nervis prominentibus pilosis, membranacea; nervi palmati, circiter 7, nervis tertiariis numerosis reticulatis; petioli graciles, 2.5 cm. longi, densissime molliter pilosi, pilis flavis. *Ramuli floriferi* usque ad 13 cm. longi; cymulae ♀ circiter 35, 3–5-floræ in axillis foliorum reductorum bracteorum dispositae; bractee late ovatae, acute acuminatae, 1.75 cm. longae, subsessiles, nunquam peltatae. *Flores* ♀ pedicellis pilosis circiter 2.5 mm. longis. *Sepala* ovata, acuta, pilosa. *Petala* transverse elliptica, vix pilosa. *Carpellum* dense pilosum sed stigma glabrum. *Drupae* ambitu late obovatae, compressae, pilosae, circiter 4.5 mm. longae, circiter 3.5 mm. latae, dorso costis transversis ornatae et utrinque verrucosae.

TROPICAL AFRICA. Tanganyika Territory: Kyimbila District, *Stolz* 1600.

1704. *Phylica Thodei* *Phillips* [Rhamnaceae]; species ramis dense villosis, foliis lanceolato-linearibus villosis, capitulis sessilibus 1.2–1.3 cm. diametro distincta.

Suffrutex 30–60 cm. altus; rami dense villosi. *Folia* lanceolato-linearia, obtusa, 8–9 mm. longa, 1–1.5 mm. lata, villosa, marginibus recurvis. *Capitula* terminalia, sessilia, 1.2–1.3 cm. diametro. *Bractee* lanceolatae, 5 mm. longae, dense villosae. *Calycis* *tubus* campanulatus, 1.5 mm. longus, villosus; lobi ovati, obtusi, 2 mm. longi, dorso pilis longis albis obtecti. *Petala* 0.5 mm. longa, valde cucullata. *Stamina* calycis tubo inserta; filamenta 0.5 mm. longa; antherae ovatae, basi obtuse cordatae. *Ovarium* villosum; stigma sessile, obtuse trilobatum.

SOUTH AFRICA. Natal: stony, grassy places at Olivier's Hoek, 1900–2200 m., *J. Thode* in Nat. Herb. S. Afr. 2748.

1705. **Erlangea Mooreana** *Alston* [Compositae]; ad *E. trifoliatam* De Willd. accedit, sed bracteis minus acuminatis margine haud translucente et subaequalibus, foliis angustioribus infra nervis glabrescentibus differt.

Suffrutex erectus usque ad 0.75 m. altus; caulis inferne simplex, superne ramulis gracilibus, striatus, pubescens. *Folia* plerumque ternatim verticillata, lanceolata, apice acuta, basi vix petiolata, circiter 3.25 cm. longa, 1 cm. lata, utrinque punctata, supra scabrida, infra nervis inconspicuis, costis leviter puberulis glabrescentibus. *Capitula* corymboso-paniculata, usque ad 1 cm. lata. *Bractee* ovato-lanceolatae, herbaceae, usque ad 7.5 mm. longae et 4 mm. latae, vix acuminatae, leviter recurvatae, extra scabridae, primum subaequales sed fructu interiores purpureae et accrescentes, marginibus haud translucetibus. *Flores* rubro-purpurei ad rosei. *Antherae* apice appendiculatae. *Achaenia* 5-gona, curvata, minute papilloso-glandulosa. *Pappi* *setae* paucissimae, plerumque solitariae, aristatae, caducissimae.

TROPICAL AFRICA. Tanganyika Territory: Bulambya Mwalabila, 1400 m., savannah forest, fl. Mar., *A. Stolz* 2569.

1706. **Psednotrichia australis** *Alston* [Compositae]; affinis *P. tenellae* Hiern, sed capitulis radiatis, floribus discoideis homogamis differt.

Herba annua, 6 cm. alta; caulis simplex vel parce ramosus, basi foliosus, glaber. *Folia* lineari-spatulata, 5 mm. longa, fere 1 mm. lata, plana, glabra, nervis inconspicuis, superiora filiformia. *Capitula* radiata, multiflora; receptaculum nudum, leviter alveolatum. *Involucrum* alabastro subglobosum; bractee circiter 16, biseriatae vel subuniseriatae, usque ad 3 mm. longae, acutae. *Pappus* uniseriatus, setosus, setis circiter 15 caducis, corollae tubo subaequans. *Flores* radii ligulis 2.5 mm. longis obtusis flavis; flores disci regulares, corollis 5-fidis; styli rami breves, apice triangulares. *Achaenia* obovata, compressa, bicostata, pilosa.

SOUTH AFRICA. Cape Prov.: Ceres Div.; Zwaar Moer, 2500 ft., locally abundant on clay, *Mrs. Levyns* 1059.

1707. *Calostephane setosa* Alston [Compositae]; *C. divaricatae* Benth. affinis, sed inter omnes species bracteis ovato-lanceolatis differt.

Herba setoso-scaberula, circiter 35 cm. alta, erecta, ramosa, ramis ascendentibus alatis parce foliosis. *Folia* lanceolata, acuta, basi decurrentia, usque ad 3.5 cm. longa, 4.5 mm. lata, scaberula, pellucido-punctata, uninervia. *Bractaeae* externae lanceolatae, internae ovato-lanceolatae, membranaceae, costis conspicuis et marginibus setosis, apice acute acuminatae, 7 mm. longae, 1.5 mm. latae. *Capitula* radiata, ligulis 3-dentatis 1 cm. longis 4 mm. latis luteis. Flores disci setulosi. *Achaenia* pilosa; pappi squamae 10, exteriores 5 paleaceae, interiores 5 aristatae, plus minusve connatae.

TROPICAL AFRICA. Rhodesia: Sesheke, fl. April, A. E. Gairdner 549.

1708. *Geigeria elongata* Alston [Compositae]; species insignis, habitu valde distincta, ramis elongatis purpureis foliis linearibus.

Suffrutex gracilis; ramuli atro-purpurei, glabri, in siccitate sulcati, internodiis circiter 3 cm. longis. *Folia* alterna, lincaria, 8 cm. longa, 1 mm. lata, uninervia, integra, glabra, supra plana, infra margine incurvata, basi et apice sensim angustata. *Capitula* solitaria, axillaria, sessilia vel fructu breviter pedunculata, pedunculis usque ad 4 mm. longis. *Involucrum* urceolatum; bractaeae coriaceae, multiseriatae, uninerviae, apice mucronatae vel exteriores foliaceae, usque ad 2.5 cm. longae; receptaculum longe pilosum; ligulae usque ad 0.75 cm. longae; corollae lobi florum discoidorum apice margine pilis paucis brevibus induti; stylus profunde bifidus; achaeia pilosa; pappus squamosus; squamae aliae aristatae, aliae obtusae.

SOUTH AFRICA. Transvaal: Badsloop, R. Schlechter 4283.

1709. *Osmitopsis parvifolia* Hofmeyr. comb. nov. [Compositae]. *Osmites parvifolia* DC.

Suffrutex corymboso-ramosus, dense foliatus. *Folia* persistentia, sessilia, oblongo-obovata, 0.5–1 cm. longa, setoso-dentata, glanduloso-punctata. *Capitula* terminalia, sessilia, circiter 1.5 cm. diametro. *Involucri* bractaeae circiter 3-seriatae, apicem versus rubescentes, marginibus submembranaceis denticulatis. Pappus nullus.

SOUTH AFRICA. Stellenbosch Div.: Lowrys Pass, 340–600 m. Drège! Mac Owan 1771! Schlechter 5317! Alexander Prior!

When examining some of the *Compositae* in the National Herbarium, Pretoria, it was found that specimens labelled *Osmites parvifolia* DC. did not conform to the description of the genus on account of the absence of a pappus. Reference to Kew confirmed the opinion that the species would be better referred to *Osmitopsis*.

1710. *Tricholaena melinioides* Stent [Gramineae]; affinis *T. setifoliae* Hochst. ex A. Rich. spiculis paulo minoribus ad latera magis convexis glabrisque distincta.

Gramen perenne. *Culmi* in rhizomate brevi oblique arcte congesti, subgraciles, multinodi, circiter 70 cm. alti, ad nodos molliter pilosi, caeterum glabri, tenuiter striati, simplices vel inferne magis minusve ramosi, internodiis (praeter summa) quam vaginae foliorum brevioribus exsertis, summo ipso plerumque longissimo. *Foliorum* vaginae arctae, pilis e tuberculo ortis molliter hirsutae vel glabrescentes; ligulae breves, ciliatae; laminae lineares, acuminatae, planae, pilis e tuberculo ortis hirsutae et ciliatae, ad 10 cm. longae, sed plerumque breviores, ad 7 mm. latae, costa nervisque tenuibus. *Panicula* angusta, plus minusve contracta, 10–15 cm. longa; rhachis teres, tenuiter striata, ad nodos tenuissime pubescens, caeterum glabra, uti rami ramulique rubens vel atropurpurea; rami solitarii vel subbinati; pedicelli solitarii, praeter summos breves, apice pilis longis albis muniti. *Spiculae* 3 mm. longae, purpurascens, ad callum barbatulae. *Gluma inferior* explanata, late elliptica, truncata vel emarginata, 0.5 mm. longa, glabra, tenuis; *superior* spiculae longitudine, a latere visa oblique oblonga, in dorso infra medium levissime gibbosa, apice breviter obtuse 2-loba, 5-nervata, ad latera valde convexa, laevis et nitidula nisi ad nervorum anastomosin parce barbata, ad margines breviter, e carina longius ciliata, ciliis dorsalibus summis ad 3 mm. longis, e sinu aristata arista 5 mm. longa. *Anthoecium inferum* ♂ vel cassum; *valva* glumae superiori similis nisi angustior et basi oblique attenuata, quam ea vix (rarius conspicue) brevior, tenuissime 5-nervata, intra margines basi excepta sericeo-pilosa pilis summis ad 2.5 mm. longis, in dorso scaberula, caeterum glabra; *palea* angusta, quam *valva* magis minusve brevior, truncata, tenuiter bicarinata; *antherae* si adsunt ad 1.5 mm. longae. *Anthoecium superum* ♀ ad 2 mm. longum; *valva* a latere visa oblonga, obtusa, minute 2-loba, tenuissime membranacea, glabra, subenervosa; *palea* subaequilonga, quam *valva* angustior, ecarinata; *ovarium* oblongo-ellipsoideum, stylis brevibus, stigmatibus lateraliter exsertis. *Cariopsis* ignota.

TROPICAL AFRICA. South Rhodesia: Marandellas, 1500 m., *Eyles* 3456; Salisbury, 1450 m., *Eyles* 2191 (type specimen); Mazoe, 1250 m., *Eyles* 2235.

XLVIII.—MUSA DAVYAE IN EXTRA-TROPICAL TRANSVAAL.

J. BURTT DAVY.

The genus *Musa* having been omitted from the Flora Capensis owing to an unfortunate confusion as to its locality not being extra-tropical, the writer has been asked to furnish a note on the distribution of the Transvaal Wild Banana, *Musa Davyae* Stapf.

A photograph of a "Banana," which in the absence of botanical material could not then be precisely identified, was sent to the Editor of the Transvaal Agricultural Journal, and was reproduced on the cover of that publication in April, 1904. The photograph of this ornamental monocarpic plant was taken from a specimen growing at the Government Agricultural Experiment Station, Tzaneen, Pietersburg District, to which it had been transplanted from a kloof near by, by the Manager, Mr. H. S. Altenroxel.

In January, 1905, Mr. H. Mingard, of Elim, in the Spelonken area of the Zoutpansberg District (a little north of the tropic), sent to Pretoria specimens of *Kaempferia Ethelae*, among which was a portion of a leaf of a *Musa* (Transvaal Department of Agriculture, No. 19 in Herb. Kew.), which has since been identified by Dr. Stapf as *M. Davyae*.

In company with my wife I visited Tzaneen in January, 1906, and found the same *Musa* growing in quantity on the farm "Helpmakaar," on the eastern slopes of the Houtboschberg, in the Pietersburg District (*Burt Davy* 5170), and also in Magoo Kloof (*Burt Davy* 5194) at Mashoeti Hill near New Agatha, and in a kloof on the farm "Westphalia." It has been reported also from Diepkloof, Magoepa Mt., Saleboels Kop near Duivels Kloof. All these localities are half a degree south of the tropic and their altitudes range from 2800 to 4800 ft. I am informed that it occurs also at Pisang Kop in the Zoutpansberg District, and that it is abundant at much lower altitudes along the rivers of the Low-veld below Krabbefontein in the Pietersburg District.

My specimens were obtained from plants growing in a shaded kloof among quartzite boulders in the bed of a mountain stream with their bases usually in shallow running water. The plants were 15 to 20 ft. high or more, and about 2 ft. in diameter at 1 ft. above the base. The leaf-blades, measured at the time, were 12-15 ft. long and 20-24 inches broad, subglaucous, with a red midrib; the sap was cream-coloured, not red as in *M. Livingstoniana*. The ripe fruit is yellow; the seeds smooth, dull brown, immersed in a sparse insipid yellow pulp, and with farinaceous endosperm. Detailed drawings which were made at the time by Mrs. Burt Davy, formed the basis for the description of the species published in the *Kew Bulletin*, 1913, p. 102, and were deposited in the Kew collection in 1924, together with a photograph of the Tzaneen plant. From the seeds several fine plants were raised, one of which, in the writer's garden at Pretoria, had attained a height of 15 ft. in 1911, although the leaves were cut back by the frost each winter.

Specimens and seeds from the same collection were brought by me to Kew in June, 1907, where they were named *M. ventricosa* (See *Kew Bulletin*, 1908, p. 147; *Transv. Agric. Journ.* v. 422, 1907; *Agric. Journ. Union of S. Afr.* i. 93, 1911). Seeds sent to the Gardens failed to germinate. In 1924 I sent to

Kew two living plants, raised from the same batch of seeds, but one of them failed to survive.

In 1907 Mr. W. H. Johnson sent to Kew specimens (*Johnson* 54) of the same species, which he had collected at about 1300 ft. in the forest at Amatonga's Kraal, Portuguese East Africa, east of the Limpopo River, in nearly the same latitude as Elim. His plants were 30–40 ft. high with very erect leaves 12–15 ft. long.

At my suggestion Mr. W. C. Worsdell visited the Eastern Zoutpansberg in December, 1909, and collected fruit and seeds of a *Musa* within about half a mile of the fruit farm "Westphalia." These were sent to Kew with a note which unfortunately indicated that the locality was "about 60 miles north (instead of *east*) of Pietersburg," which would place it about half a degree within the tropics, instead of outside. A MS. note in the Kew Herbarium states that "Worsdell's specimen was enumerated in the Flora Capensis as *Musa ventricosa* Welw., but struck out of the proof on the locality being found to be within the tropics."

Musa Davyae is a very decorative plant, the red midrib contrasting beautifully with the bright green of its leaves, and it is worthy of cultivation in a temperate house and would probably succeed in the open in the south-west of England. Its vernacular names are "Mateela" (Sesutu) and "Mawdawla" (Modjadjies). The Dutch name for Banana is Pisang and the place-name "Pisang Kop," applied to a hill in the Zoutpansberg District, is probably derived from this plant, or from a species of *Strelitzia*.

The leaf yields a fibre used locally by the natives and the green leaves have been employed successfully for making temporary flower pots for young nursery stock; when set in the ground the "pot" soon rots, leaving the roots of the young tree free.

Another extra-tropical species of *Musa*, producing stolons and edible fruit, is said to occur wild in certain mountain kloofs in Swaziland (approximately between Lat. 26° and 27° S.), but I have not seen specimens.

XLIX.—CONTRIBUTIONS TO THE FLORA OF SIAM.*

Additamentum XVI.

D. G. DOWNIE.

The Orchid collections made in Siam by Dr. A. F. G. Kerr had been examined by Mr. R. A. Rolfe a short time before his death. The present and following Additamentum dealing with these Orchids contain diagnoses of those which Mr. Rolfe had

* Continued from *Kew Bull.*, 1925, p. 23.

marked as new species and to which he had given mss. names, but which, so far as can be traced, he had not described.

Microstylis carnosula Rolfe mss. [Orchidaceae-Epidendreae]; species nova ob labellum parvum carnosum insignis, *M. congestae* Reichb. f. affinis sed labello minore angustiore et multo magis carnosio differt.

Terrestrial, about 20 cm. tall; pseudobulb ovoid, depressed, 2 cm. broad. *Leaves* 3, elliptic-lanceolate, acute, 5–10 cm. long, 1.5–3 cm. broad, 3–5 nerves. *Scape* 18 cm. tall; raceme 3 cm. long, dense flowered; bracts reflexed, linear-lanceolate, acuminate, 2.5–3 mm. long; pedicels 3 mm. long; flowers small, numerous. *Sepals*, posterior often reflexed and becoming anterior, oblong-lanceolate, slightly broader at base, gradually tapering to rounded apex, 2.5 mm. long, 1 mm. broad at middle, 1 main vein; lateral similar to posterior but slightly curved, apex rounded or truncate-rounded, 2–2.5 mm. long, 1 mm. broad, 1 main nerve. *Petals* linear, apex rounded, 2.5–3 mm. long, less than 0.5 mm. broad, 1-nerved; labellum very shortly clawed, narrowly triangular, fleshy, 3-lobed, basal angles rounded, nearly 2.5 mm. long, 1.5 mm. broad across basal angles, 5-veined, middle lobe largest, ovate, acute-rounded, slightly over 0.5 mm. long, side lobes small, triangular, fleshy; lip concave, separated from very short claw by fleshy callus; claw 0.5 mm. long, 0.5 mm. broad. *Column* erect, stout, 1.5 mm. long, broader at base, two rather large triangular fleshy lobes arising on sides of clinandrium and projecting above anther. *Ovary* with pedicel 3 mm. long.

Doi Sutep, 900 m., open jungle, August 27th, Kerr 278.

Microstylis siamensis Rolfe mss. [Orchidaceae-Epidendreae]; a *M. Wallichii* Lindl., var. *omphaloide* Parish, labello multo altius lobato, lobis duobus terminalibus imbricatis recedit.

Terrestrial, erect, about 30 cm. tall; pseudobulb ovoid, depressed, 2 cm. long; roots filiform; leafy stem about 8 cm. tall, clothed with leaf bases. *Leaves* 5, ovate, shortly or rather markedly acuminate, apex minutely, regularly serrate, 7–11.5 cm. long, 3.7–4.5 cm. broad at middle, glabrous, 3–5 main veins; petiole about 1.5 cm. long; leaf base rather loosely sheathing, about 2 cm. long. *Inflorescence*, axis slender, lax-flowered, glabrous, 21 cm. long above leafy area, non-bracteate peduncle 8.5 cm. long; flower bracts at intervals of 6–10 mm., linear-lanceolate, acuminate, 4.5–6 mm. long, 1-nerved. *Sepals*, posterior lanceolate, apex truncate, 8.5–9 mm. long, 2 mm. broad at broadest part, 3-veined; lateral oblique, ovate to broadly ovate, apex obtuse or rounded, 6–6.5 mm. long, 2.5–3 mm. broad at broadest part, 3-veined. *Petals* linear, apex obliquely truncate, 9 mm. long, 0.7–1 mm. broad, 1 vein; labellum cordate, deeply auricled, apex markedly bilobed, lobes overlapping, 10–11.5 mm. long (including apical lobes which are 1 mm. long and auricles which are 4–5 mm.

long), 6 mm. broad at widest part, 9-veined ; sac small, rounded, about 1.5 mm. diameter. *Column* short, broadening towards the clinandrium, 2 mm. tall (to tip of arms of stylidia), 1.5 mm. across arms of stylidia ; in front of column at base is a small truncate lobe connected with mouth of sac ; stylidia projecting beyond rest of column, each arm ridged down the centre ; anther erect, attached at back of clinandrium, shallow, slightly depressed on outer surface, about 1 mm. long, 0.5 mm. broad ; stigma with thin lobe in front. *Ovary* ridged and curved ; ovary with pedicel about 1 cm. long.

Doi Sutep, 720 m., evergreen jungle near a stream, *Kerr* 100.

***Microstylis sutepensis* Rolfe mss.** [Orchidaceae-Epidendreae] ; ab affini *M. Thorelii* Finet, labelli lobis lateralibus maioribus, stylidiis magnis spatulatis fuscis recedit.

Terrestrial, erect, 14–21 cm. tall ; pseudobulb 1.5–2 cm. long ; leafy stem 3–5 cm. long, clothed with leaf bases. *Leaves* 3–4, erecto-patent, ovate to broadly ovate, acute or obtuse, 6–8.5 cm. long, 2.25–3 cm. broad, 3–6 main veins, midrib slightly ridged on back ; petiole narrow to rather broad, 1–1.5 cm. long ; sheathing base loose, about 1.5 mm. long. *Scape* 9–15 cm. long, slender, rather densely flowered, glabrous, angular ; peduncle 5 cm. long ; flowers medium-sized, bracts linear-lanceolate, acuminate, deflexed, 4.5–8.5 mm. long. *Sepals*, posterior linear-lanceolate, apex rounded-truncate, 6.5 mm. long, 1.5 mm. broad, 3-veined ; lateral narrowly ovate, curved, apex rounded, 4.5 mm. long, 2 mm. broad, 3-veined. *Petals* linear, apex rounded, 6 mm. long, slightly over 0.5 mm. broad, 1-veined ; labellum narrowly cordate, deeply auricled, apex shortly broadly acuminate, slightly incurved, 7.5 mm. long (including auricles which are 3 mm. long), 4 mm. broad at widest part, 5 main veins ; sac small, narrow oval mouth, 1.5 mm. long, 0.5 mm. broad, with a thickened triangular callus on either side of mouth. *Column* 0.75–1 mm. tall to base of anther ; on either side of column at apex arises a large, dark, spatulate stylidium with a swollen ridge on inner face extending as a thin membrane in front of anther and projecting beyond anther, 1 mm. long, 0.75 mm. broad ; slight thickened ridge at base of column slightly overhanging mouth of sac ; anther erect, between stylidia, attached at apex of column at back, 0.75 mm. high ; stigma enclosed by bases of stylidia. *Ovary* and pedicel 4–5 mm. long, ridged. *Fruit* about 12 mm. long, pedicel 5 mm. long.

Doi Sutep, 660 m., mixed jungle, May 20th, *Kerr* 329.

***Microstylis tenebrosa* Rolfe mss.** [Orchidaceae-Epidendreae] ; ab affini *M. polyodonte* Hook. f., floribus atropurpureis maioribus recedit.

Terrestrial, erect, 25–30 cm. tall ; pseudobulb about 1 cm. long ; roots filiform ; leafy stem very short, 2.5 mm. long. *Leaves* 4, erect or erecto-patent, narrowly ovate or ovate, acute

or acuminate, tapering to petiole, 4–10.5 cm. long, 1.5–3.3 cm. broad, 3–5 main veins; petiole rather long, slender, 3–4 cm. long, sheathing bases long and shortly overlapping, 1–1.5 cm. long. *Scape* slender, 22–30 cm. above leaves, ridged, glabrous; peduncle 13–15 cm. long; inflorescence axis 10–14 cm. long, lax-flowered; bracts deflexed, linear-lanceolate, acuminate, 4–8 mm. long, 1-veined, bract intervals 4–12 mm.; flowers erecto-patent or patent. *Sepals*, posterior oblong, obtuse, very slightly narrower at base, 6.5–7 mm. long, 2 mm. broad, 3-veined; lateral sepals oblong-ovate, oblique, apex bluntly rounded, slightly recurved, 4.5–5 mm. long, 2.5–3 mm. broad, 4-veined. *Petals* linear, broader above middle, apex rounded or truncate, 6.75–7 mm. long, 1–1.5 mm. broad at broadest part, 1–3-veined; labellum almost round, deeply auricled at base, all margin except auricles markedly long-fringed, 8–9.5 mm. long from tip of auricle to end of fringe, 8–9 mm. broad (including fringe which is 1.5 mm. long), veins well marked; sac very small, shallow, mouth about 0.75 mm. across; in front of column fleshy lobe projects slightly over mouth of sac. *Column* short, broadening out toward apex, 0.75 mm. tall at back (not including anther); at each side is a somewhat rounded, fleshy, incurved stylidium, ridged down inner face, membrane stretched in front of anther between ridges of stylidia; anther erect, attached at back, sub-orbicular; stigma with thin membrane in front. *Ovary* with pedicel 8–11 mm. long, with 6 longitudinal ridges, glabrous.

Doi Sutep, 1350 m., open jungle, flowers very dark purple, September 5th, *Kerr* 209.

Liparis odorata Lindl. var. *longiscapa* Rolfe mss. [Orchidaceae-Epidendreae]; a typo scapo longiore robustiore, floribus paulo maioribus recedit.

Erect, 41 cm. and probably up to 49 cm. tall, rhizome very short; pseudobulb pyriform, 14 mm. long, 12 mm. broad; leafy stem short, with 2 or 3 vaginate, overlapping scales 4–5 cm. long at base. *Leaves* 2–3, erecto-patent or erect, ovate-lanceolate, obtuse, glabrous, base narrowing slightly to form vagina, 8–9.5 cm. long, 1.7–2.8 cm. broad at middle. *Scape* very long, slender, glabrous, 34–38 cm. long above leafy area, one or two isolated bracts on long peduncle; inflorescence axis 9–14 cm. long, lax-flowered, flower internodes about 9–16 mm. long, flower bracts patent or reflexed, lanceolate, acuminate, 4–6.5 mm. long, 1-veined, glabrous; flowers erecto-patent. *Sepals*, posterior linear-lanceolate, apex truncate-rounded, 12 mm. long, 2.5 mm. broad at widest part, 5-veined; lateral almost semi-circular, straight on side nearest labellum, apex rounded, with fleshy ridge on back in centre, up to 7.5 mm. long, 4.25 mm. broad (one slightly smaller and narrower than the other). *Petals* narrowly spatulate, slightly oblique, apex rounded, 11 mm. long, 2 mm. broad at widest part, 0.75 mm. broad near base, slightly folded; labellum very broadly obovate, apex widely

notched and with short, rounded, fleshy mucro in centre, upper margin very shortly, rather regularly, serrulate, 6 mm. long in middle (0.5 mm. longer at sides), 7.75 mm. broad at widest part, with two curved, fleshy, triangular calli, 1.5 mm. high, on upper surface at base and two triangular, downward projecting auricles about 1 mm. long, along side of column. *Column* curved, overarching labellum, 6.5 mm. tall without anther, winged on sides in upper part; anther almost round, very slightly apiculate in front, 1.5 mm. long, 1.5 mm. broad. *Ovary* with pedicel 9 mm. long.

Doi Sutep, 300-900 m., deciduous jungle, June 20th, Kerr 108.

***Liparis siamensis* Rolfe mss.** [Orchidaceae-Epidendraceae]; species nova *L. rostratae* Reichb. f. affinis sed bracteis multo maioribus facile distinguenda.

Terrestrial, erect, 12-17 cm. tall; pseudobulbs 1-1.8 cm. long, 7-10 mm. across, covered by sheathing bract; leafy stem about 1.5-2 cm. long, with 2 or 3 sheathing membranous scales at base 2-3 cm. long. *Leaves* 2, erecto-patent or almost patent, broadly ovate, apex acute or rounded, bases sheathing and overlapping, 7.5-13 cm. long, 3-6.2 cm. broad. *Scape* robust, glabrous, peduncle with 1 or 2 scattered bracts; inflorescence axis 2-6.5 cm. long, densely flowered; flower bracts reflexed, linear-lanceolate, tapering to acute apex, 12.5 mm. long, 1-nerved; flowers erecto-patent or sometimes patent. *Sepals*, posterior narrowly elliptic, apex rounded, slightly concave, fleshy, mucronate on back, 7.5 mm. long, nearly 2 mm. wide in middle, rather broad at base, 3-veined; lateral ovate, curved, apex rounded, slightly concave, fleshy ridge on back, 6.5-7 mm. long, 2.5 mm. broad in middle, 4-veined. *Petals* elongate, linear-spathulate, apex rounded, 7.75 mm. long, 0.75 mm. broad at widest part, 1-veined; labellum nearly oblong, stipitate, fleshy, truncate-rounded apex, slightly depressed in middle, rounded lobe in middle depression, side angles rounded and erose to almost minutely irregularly papillose, 7 mm. long over all, oblong part 4.25 mm. long, 7.25 mm. broad, stipitate part 2.5 mm. long, nearly 2.5 mm. broad, continued into backward-projecting very small rounded lobes on each side of column; in front of column on lip is a pear-shaped callus, 1 mm. long, 0.75 mm. tall at side furthest from column. *Column* semi-terete, nearly 4 mm. tall without anther, curved, bent inwards over towards labellum, winged at sides in upper half. *Ovary* with pedicel 1.95 cm. long. *Capsule* 14 mm. long; pedicel 14 mm. long.

Doi Sutep, 330-450 m., deciduous jungle, flowers green, July 6th, Kerr 158, 158a.

***Liparis sutepensis* Rolfe mss.** [Orchidaceae-Epidendraceae]; *L. olivaceae* Lindl. affinis sed bracteis longioribus, floribus maioribus, columna magis robusta differt.

Terrestrial, erect, 18.5 cm. tall ; pseudobulb narrowly ovoid, 1.8 cm. long, 0.8 cm. broad, covered by a membranous sheathing scale at base ; leafy stem less than 2 cm. long, enclosed first by membranous overlapping scales, then by overlapping leaf bases. *Leaves* 2, patent, ovate-lanceolate, apex acute or rounded, bases vaginate and overlapping, 8.7–9.8 cm. long, about 2.2–3.4 cm. broad across widest part. *Scape* stout, erect, glabrous, terete, with 4 or 5 very thin, narrow wings along axis ; peduncle about 9 cm. long above leaves, bracts 3 ; inflorescence axis 5.8 cm. long, probably subdensely flowered ; flower bracts reflexed, linear-lanceolate, acuminate, 12 mm. long ; flowers patent or erecto-patent. *Sepals*, posterior lanceolate, apex truncate-rounded, 8 mm. long, 1.75 mm. broad at middle, 3–5-veined ; lateral ovate-lanceolate, apex rounded, 7.5 mm. long, nearly 3 mm. wide at broadest part, 5-veined. *Petals* linear, slightly wider above middle, rounded at apex, 8 mm. long, 0.75 mm. broad at middle, 1-veined ; labellum spathulate, rounded at apex, 7 mm. long, 4.5 mm. broad at widest part, stalk part about 1.5 mm. broad, with 2 very short backward directed side lobes about 0.5 mm. long, thickened area along middle of labellum (linear-spathulate in shape) 5 mm. long, terminating at base in erect callus of 2 rounded triangular lobes about 0.5 mm. tall. *Column* 4 mm. long, incurved over labellum ; anther almost pyriform. *Ovary* with pedicel 8.5–9 mm. long.

Doi Sutep, 480 m., eng jungle, July 21st, *Kerr* 254.

***Liparis tenuis* Rolfe mss.** [Orchidaceae-Epidendreae] ; a. *L. delicatula* Hook. f. labello pro rata angustiore, lobis basalibus multo maioribus recedit.

Small, erect *epiphyte*, 9–12.5 cm. tall ; roots slender, terete, flexuous, pubescent ; pseudobulb narrowly pyriform, 6–10 mm. long, 2–3 mm. broad at middle, with 1 or 2 sheathing scales. *Leaves* 2–3, elliptic, mucronate, tapering to petiole, 18–34 mm. long, 5–9 mm. broad ; vagina 1–2 mm. long ; petiole conduplicate, slightly vaginate, 2–4 mm. long, separated from vagina by a ridge. *Scape* slender, 8–11 cm. long ; peduncle with 1 or 2 isolated bracts ; inflorescence axis 4–7 cm. long, subdensely flowered ; flower bracts erecto-patent or patent, ovate-lanceolate, tapering to apex, 2.5–3.5 mm. long, 1.25 mm. broad at middle ; flowers pale green (ex *Kerr*), erecto-patent. *Sepals*, posterior ovate, obtuse, margin recurved, 2.5 mm. long along middle, nearly 3 mm. long at sides, nearly 1.5 mm. broad at middle ; lateral ovate, margins probably recurved, 3.25 mm. long, 1.75 mm. broad. *Petals* linear, rounded at apex, 2.5 mm. long, about 0.5 mm. broad ; labellum rather short, broadly sagittate, shortly bluntly mucronate, 2 mm. long, 1.5 mm. broad (across middle of middle lobe), rather wider across side lobes, side lobes about 0.5 mm. long, margins recurved ; at base of labellum is 2-lobed callus ridge (about 0.5 mm. high) ;

labellum reflexed from above side lobes. *Column* winged more than half way at top in front, 1.25 mm. tall without anther. *Ovary* with pedicel 3-4 mm. long.

Doi Sutep, 960 m., on small trees in thick evergreen jungle, July 10th, *Kerr* 250.

***Dendrobium Dixonianum* Rolfe mss.** [Orchidaceae-Epidendreae]; a *D. pycnostachyo* Lindl. floribus maioribus labello trilobato, a *D. alpestre* Lindl. labello minus serrato recedit.

Inflorescence erect, terminal, 4.5 cm. long, 5-7-flowered; bracts patent, narrowly ovate, acuminate, 3-3.5 mm. long; flowers patent. *Sepals*, posterior lanceolate, acuminate, 7.5 mm. long, nearly 2 mm. broad, 3-veined; lateral oblique, narrowly ovate, acuminate on side away from labellum, triangular and incurved on side nearest labellum, base slightly concave, 6.5 mm. long along middle, 2 mm. wide across centre, 5 mm. wide across base, 3-5-veined. *Petals* very narrowly spatulate, with long acumen, 7 mm. long, 1.5 mm. broad at middle, 1.75 mm. across widest part, 3-veined; labellum narrowly cordate, stipitate, 8.5 mm. long, 3-lobed; middle lobe almost orbicular, acuminate, margin of acuminate apex slightly upturned, rest of margin crenate and much folded, 3 mm. long to apex (which is 1 mm. long), 2.25 mm. broad; free part of side lobes triangular, rounded at apex, slightly incurved toward middle lobe, about 1 mm. long; all margin of this lower part of labellum except stalk and near the base crenate and loosely, widely folded; stalk 1-1.5 mm. long, 1.75 mm. broad; linear ridge of callus down middle of labellum extending to beginning of lobing, 5.5 mm. long, slightly over 0.5 mm. broad at middle, ending in small, narrow, rounded lobe. *Column* 2.5 mm. high at back without anther, extending in front into foot about 4 mm. long, puberulous on upper surface; whole base of column 5.5 mm. long; clinandrium with 3 small, erect, pointed lobes on back. *Ovary* with pedicel 3-5-4 mm. long.

Doi Chiangdao, 1650-1800 m., *Kerr* 333—flowered in Trin. Coll. Bot. Gard. Flowers greenish-white, lip yellow with 3 dark lines.

***Dendrobium indivisum* Miq. var. *lampangense* Rolfe mss.** [Orchidaceae-Epidendreae]; a typo foliis brevioribus, labello saepissime trilobato recedit.

Epiphyte, tufted, 1.5-5.8 cm. tall, simple; each internode oblique, funnel shaped, 3.5-5 mm. long, 3.5-6 mm. across top, 1.5-2.5 mm. across foot, stem widest at middle. *Leaves* in 2 rows, erecto-patent, triangular, 10-12 mm. long, 5-6 mm. broad, concave and enveloping stem for less than half their lengths, fused at base round stem, apex rounded, overlapping bases 2 mm. long, concavity 5 mm. long, 2 mm. deep. *Flower bracts* cylindrical, completely ensheathing ovary, 2-lobed, one lobe slightly larger than the other, 2.5 mm. long, 1 mm. broad at middle, lobes 1-1.25 mm. long. *Sepals*, posterior ovate, apex rounded

and slightly concave, 3 mm. long, nearly 1.75 mm. broad, 3-veined; lateral broadly ovate, oblique, apex subacute, fleshy, auricled and concave at base on side nearest labellum, 3.75 mm. long up middle, 4.75 mm. along oblique side, 2.5 mm. broad across middle, 3 mm. broad at base, 3-5-veined. *Petals* narrowly ovate, apex acute, 2.75 mm. long, 1 mm. broad, 1-veined; labellum with basal oblong part and terminal ovate part, nearly 4 mm. long, 3.5 mm. broad across side lobes, oblong part nearly 2 mm. long and 1.5 mm. broad, concave at base, margins incurved, ovate part 3-lobed, middle lobe oblong with rounded angles, very short and wide, margins erose, 1 mm. long, 3 mm. broad, side lobes triangular, slightly oblique, apex truncate-rounded, very minutely apiculate; along base of middle lobe a large truncate callus 1.25 mm. broad, 0.5 mm. high. *Column* short, stout, 0.5 mm. high without anther; above column a triangular projection 0.25 mm. long to which anther is attached; foot 2 mm. long. *Ovary* with pedicel 4.5-5 mm. long.

Near Lampang, Hang Sut, 300 m., on trees in eng jungle; flowers pale green, petals with one, sepals with two longitudinal purple stripes, May 15th, *Kerr* 153.

***Dendrobium sutepense* Rolfe mss.** [Orchidaceae-Epidendreae]; a *D. xanthophlebio* Lindl. calcare curvato haud recto, lobo mediano minore recedit.

Epiphyte, 15-31 cm. tall; roots stout, terete, glabrous; stem simple, swollen at base, slightly swollen in middle, zig-zag; diameter at base 2.5-3 mm., about middle 4.5-5 mm., internodes 2.5-3 cm. long, completely and very closely covered by vaginate leaf bases. *Leaves* erecto-patent, narrowly elliptic, apex unequally bilobed, 3.2-6.8 cm. long, 1-1.6 cm. broad at middle, apical lobes rounded, 0.5-1.5 mm. difference in length; leaf bases not overlapping, same length as internodes. *Inflorescence* axis lateral, arising opposite the leaves and subterminal, 1-3-flowered, about 3-4 mm. long, enclosed by membranous bracts; flower bracts ovate, acute, concave, broad at base, 7.5-8.5 mm. long, 3-4.5 mm. broad at middle, 3-4-veined; flowers patent or erecto-patent. *Sepals*, posterior ovate-lanceolate, acute, 17 mm. long, 5-5.5 mm. broad, apex somewhat fleshy, 5-veined; lateral lanceolate, acuminate, apex fleshy and very shortly mucronate, base broad and very oblique, 2-2.2 cm. long in middle, 5-6 mm. broad at middle, 2.6-2.7 cm. long along oblique edge, 10-11.5 mm. along base, 5-7-veined. *Petals* narrowly ovate, with tapering, shortly acuminate apex, slightly oblique at base, 18 mm. long, 5.5-6 mm. broad, 5-7-veined; spur short, fleshy, almost cylindrical, slightly flattened dorsiventrally, tip rounded, 4.5 mm. long, 2 mm. broad, 1.75 mm. deep; lip 19.5 mm. long, 14 mm. broad across apices of side lobes, middle lobe almost orbicular, acuminate, shortly broadly stipitate, margin erose and folded, incurved at apex, 9.5 mm. long, 7 mm. broad at widest part, acuminate,

apex 1.5 mm. long, base about 1.5 mm. long, 5 mm. broad, concave, side lobes truncate, erose, 11 mm. long to apex of side lobe, running along middle of lip a rather broad fleshy ridge increasing in size toward middle lobe where it ends more than half-way up, 14.5 mm. long, 2 mm. broad at widest part and 1.5 mm. near base. *Column* stout, 4 mm. tall at back, excluding anther and narrow pointed projection 1.5 mm. long to which anther is attached, 6.5 mm. tall at sides; foot about 6 mm. long, whole base of column 9 mm. long; anther truncate, erose in front, 2.75 mm. long, 2.25 mm. broad. *Ovary* with pedicel 1.6–2.2 cm. long. *Capsule* 1.1 cm. diameter, 2 cm. long, excluding persistent remains of column and spur, pedicel 1.5 cm. long.

Doi Sutep, 1500–1650 m., on trees in evergreen jungle; flowers white, sweet scented; lip with yellow disc, side lobes veined pink, April 17th, *Kerr* 91.

Cirrhopetalum siamense Rolfe mss. [Orchidaceae-Epidendreae]; a *C. picturato* G. Lodd. floribus minoribus sepalisque lateralibus pro rata minoribus, a *C. Roxburghii* Lindl. scapo brevioris labello pro rata multo minore recedit.

Epiphyte, rhizome 8–14 mm. long; roots rather stoutly filiform, glabrous; pseudobulb broadly pyriform, probably 3 or 4-angled, 12–15 mm. tall, 10–11 mm. broad, glabrous, polished, young pseudobulb covered by 1 or 2 membranous scales, 7–17 mm. long. *Leaves* solitary, narrowly elliptic, apex probably shortly bilobed, base tapering to short conduplicate petiole, 6.6–7.6 cm. long, 1.6–1.9 cm. broad at middle, petiole 4–10 mm. long. *Scape* lateral, slender, glabrous, clothed at base by sheathing membranous bracts, 3.5–4 mm. long (not including flowers); peduncle with 2 or 3 bracts, 2–2.5 mm. long; inflorescence almost an umbel, 3-flowered; bracts lanceolate, acute, 2 mm. long; flowers erect. *Sepals*, posterior ovate, acumen 1.5–2 mm. long, base broad, 5.25 mm. long, 2 mm. broad at broadest part, long slender hairs along margin (about 1 mm. long); lateral linear-lanceolate, acute, slightly oblique, auricled at base on side nearest labellum, 11.5–14.5 mm. long, 2–2.3 mm. broad at middle and at least 2.5 mm. broad at base, 4-veined. *Petals* lanceolate, with long tapering apex ending in hair-like projection, 4.75 mm. long (including hair-like apex which is 1 mm. long), 1.3 mm. broad at broadest part, long thread-like hairs along margin; labellum small, deeply curved and concave, triangular when flattened out, 3 mm. long, 3 mm. broad at base, fleshy at base and down middle. *Column* 1.5 mm. tall at back without anther, broad flange on either side ending in obliquely truncate lobe at apex and tapering into fleshy base, long curved foot 2.5 mm. long, whole base of column and foot 3.5 mm. long. *Ovary* with pedicel 4.5–5.5 mm. long.

Near Lampang, Hui Mê Tan, 360 m., on trees in deciduous

jungle ; dorsal sepal and lateral petals maroon, greenish towards base, lateral sepals yellowish-white with fine purple spots, lip greenish-brown, October 20th, *Kerr* 317.

Plants collected in above locality flowered in Chiangmai.

Cirrhopetalum sutepense *Rolfe mss.* [Orchidaceae-Epidendreae] ; a *C. caudato* King et Pantling sepalis multo brevioribus, a *C. caespitoso* Wall. scapo multo brevioris recedit.

Epiphyte, rhizome short ; pseudobulb pyriform to almost globose, 6-7.5 mm. long, 4.5-6 mm. broad. *Leaves* solitary, ovate-lanceolate, apex rounded and minutely mucronate, margin near apex very finely serrate, 22-31 mm. long, 5.5-7.5 mm. across at broadest part, petiole conduplicate, 1-2 mm. long. *Scape* lateral, rather stout, with overlapping membranous scales at base, 4.5 mm. long ; inflorescence almost an umbel, 4-6-flowered ; bract ovate, shortly acuminate, 3.5 mm. long, 1.5 mm. broad, 1-nerved ; flowers erect. *Sepals*, posterior ovate, acuminate, concave, 3 mm. long, 1.75 mm. broad at broadest part, puberulous on the back, 3-veined ; lateral lanceolate, long-acuminate, oblique, concave on side nearest labellum, 6 mm. long, 1.5 mm. broad at broadest part, apex 4 mm. long, 3-veined, puberulous on back. *Petals* narrowly elliptic, curved, apex acute, 1.5 mm. long, 0.5 mm. broad, 1-nerved ; labellum small, incurled, side lobes erect, triangular, apex rounded, middle lobe linear, 0.75 mm. long, puberulous, apex acute. *Column* 1 mm. tall with anther, almost globular, very concave in front, side lobes obliquely truncate and with minute apiculus on anther side, 2 mm. along base including foot ; foot 1.25 mm. long, curved up at labellum end. *Ovary* with pedicel 3 mm. long. *Capsule* obovoid, 6 mm. long, 3.5 mm. diameter ; pedicel almost 1 mm. long.

Doi Sutep, 600-750 m., on trees in deciduous jungle, flowers yellow, June 4th, *Kerr* 162.

Eria sutepensis *Rolfe mss.* [Orchidaceae-Epidendreae] ; ab affini *E. ingente* Reichb. f., floribus maioribus, labello trilobato recedit.

Terrestrial, pseudobulb long, narrow, 6-9 cm. long, 0.6-1.2 cm. broad. *Leaves* 4, erect or curved, lanceolate, often conduplicate, apex rounded, base tapering gradually to a variable petiole, 14-23.4 cm. long, 1-2.9 cm. broad at broadest part, margin entire, petiole practically absent in lowest leaf, up to 4 cm. long in younger leaves. *Scape* lateral, subdensely flowered, 9-16 cm. long, shorter than leaves, peduncle short with 1 or 2 bracts, 1-5.5 cm. long ; bracts reflexed, linear-lanceolate, acuminate to rather long-acuminate, 1-2.3 cm. long ; flowers erecto-patent. *Sepals*, posterior narrowly lanceolate, acuminate, 11.5 mm. long, 2.75 mm. broad at middle, 3-veined ; lateral lanceolate, acuminate, oblique especially at base, and broadly attached to foot, side nearest labellum slightly auricled, extending over base of labellum, 11 mm. long, 3 mm. broad at middle, 4.5 mm. broad

at base, 3-veined. *Petals* linear-lanceolate, acuminate, obliquely attached, 10 mm. long, 2 mm. broad at middle; labellum 3-lobed, 8 mm. long, 5 mm. broad (across side lobes); middle lobe broadly ovate, apiculate, 3.5 mm. long, 3 mm. broad, apiculus nearly 0.5 mm. long; free part of side lobes triangular, apex truncate-rounded, slightly incurved, 1 mm. long, 1.25 mm. broad, 5.5 mm. long from base of lip, 3 parallel ridges on upper surface of lip about 4 mm. long from base, the 2 external ridges terminating in semi-ovate erect callus, 0.5 mm. high. *Column* short, 2.5 mm. high at back (without anther), extending into foot about 3.5 mm. long; stigma with a small projecting lobe on each side. *Ovary* with pedicel 17-19 mm. long, pubescent.

Doi Sutep, 900 m., on damp rocks in evergreen jungle: flowers white, lip with yellow middle lobe and side lobes veined purple, fragrant; August 4th, July 28th, *Kerr* 257, 311.

Eria Wildiana *Rolfe mss.* [Orchidaceae-Epidendreae]; ab affini *E. tinctoria* Hook. f. pedunculo multo brevior, labelli lobo mediano pro rata multo minore recedit.

Epiphyte 3.8 cm. tall, pseudobulb almost globose; roots filiform, flexuous, pubescent; axis lateral, about 1.2 cm. long, clothed at base by many overlapping membranous scales 8-9 mm. long. *Leaves* 3 or 4, sheathing at base, lanceolate, often conduplicate, apex bifid, 16-19 mm. long, 4 mm. broad, vagina about 5 mm. long. *Inflorescence* axis 1.7-2.7 cm. long, sparsely pubescent, with one or two flowers; bracts lanceolate, acuminate, 5 mm. long, 1.25 mm. broad at broadest part; flowers erect or erecto-patent. *Sepals*, posterior narrowly ovate, with short rounded mucro, 11 mm. long, 3.75 mm. broad, 5-veined; lateral lanceolate, oblique, base broad, attached along foot and extending slightly beyond base of lip, auriculate on side nearest labellum, 12 mm. long, 4 mm. broad at middle and 5.5 mm. broad at base. *Petals* slightly obovate, oblique, apex obtuse, sides of apex dissimilar (obovate and obtuse side away from labellum, obovate and acuminate side towards labellum), 10.5 mm. long, 4.25 mm. broad at broadest part; labellum pear-shaped, 3-lobed, 11 mm. long, 7 mm. broad across side lobes at broadest part; middle lobe oblong-rounded, apex truncate, margin undulate, 3 mm. long, 5.25 mm. broad, probably thickened in middle; side lobes triangular, rounded at apex, 10 mm. long from base of labellum, free area about 1.5 mm. long, 2 mm. across; 3 nearly parallel ridges from base of labellum, 7 mm. long, the 2 external ridges widening at furthest end to form semi-ovate erect lobe, about 0.5 mm. high. *Column* 4 mm. tall (with anther), extending into a foot 5.5 mm. long at very acute angle to ovary, sides of column winged, continuing along foot and gradually decreasing in height; clinandrium with large membranous almost rounded lobes at sides, mucro at back to which anther is attached; anther 0.75-1 mm. across front. *Ovary* with pedicel 9.5 mm. long, densely shortly pubescent.

Doi Chiengdao, 1650–1800 m.; flowered on May 14th, 1913, in Trinity College Botanic Garden from a plant collected in January, *Kerr* 331.

***Ascotainia siamensis* Rolfe mss.** [Orchidaceae-Epidendreae]; bracteis floribusque eis *A. viridifuscae* Schlechter minoribus, labelli lobo mediano pro rata maiore.

Terrestrial, erect, 40–43 cm. tall; pseudobulbs pear-shaped, 2.3–3 cm. tall. *Leaves* wanting. *Scape* 40–43 cm. long, lax-flowered, peduncle with sheathing bracts at base and one non-sheathing half way up, 21 cm. long; inflorescence axis 22 cm. long, bract intervals 1.5–5 cm.; bracts lanceolate, acuminate, 2.5–10 mm. long; flowers erecto-patent. *Sepals*, posterior lanceolate, acuminate, 2.1 cm. long, 4.5 mm. broad at middle; lateral lanceolate, acuminate, somewhat oblique at base, 2.2 cm. long, 4.5 mm. broad. *Petals* slightly narrower than sepals, very shortly acuminate, 2.25 cm. long, 4 mm. broad; labellum 3-lobed, 13 mm. long, 7.5 mm. across broadest part of middle lobe, 11 mm. across side lobes; middle lobe almost round, mucronate, margin loosely folded, side lobes ovate, oblique, apex round, 9 mm. long; 3 parallel ridges extending more than half way up lip, 9 mm. long; spur short, almost round, 3.5 mm. long, 2.75 mm. broad. *Column* rather stout, erect, 1 mm. tall at back, deeply concave in front, with wing-like flanges at sides about 1.25 mm. deep, foot short, projecting over mouth of spur; clinandrium 1.5 mm. deep at back and with small erect lobe at back, apex acute, slightly incurved, 0.75 mm. tall; anther hooded, 1.75 mm. long, 1.75 mm. broad; rostellum small, semicircular. *Ovary* with pedicel 10–12 mm. long.

Doi Sutep, 660 m., mixed jungle; perianth brown but lip cream with faint purple spots; January 17th, *Kerr* 214.

***Ascotainia sutepensis* Rolfe mss.** [Orchidaceae-Epidendreae]; ab *A. viridifuscae* Schlechter floribus minoribus, labello lamellato recedit.

Terrestrial, erect, 54–69 cm. tall, pseudobulbs 2–2.5 cm. long, 1–1.5 cm. broad, each terminated by a solitary leaf which is clothed at the base by a sheathing scale 9 cm. long. *Leaf* ovate-lanceolate, apex probably tapering, over 20 cm. long, 5–6 cm. broad, base unequal, 15 mm. difference at base in length of lamina; petiole slender, about 19 cm. long. *Scape* slender, glabrous, lateral (arising at end of pseudobulb away from leaf), much longer than leaf, 54–69 cm. tall; peduncle 32–42 cm. long, with 4 or 5 sheathing membranous bracts at first overlapping, then becoming more distant, 3–4.3 cm. long; inflorescence axis 22–27 cm. long, lax-flowered, 8–12 or more flowers; bracts often reflexed or patent, lanceolate, acuminate, 4–15 mm. long; flowers often reflexed. *Sepals*, posterior linear-lanceolate, shortly acuminate, 15–17.5 mm. long, 2.5 mm. broad, 3–5-veined; lateral linear-lanceolate, acuminate, oblique, especially at

base, 17–18 mm. long, 3 mm. broad, 5–7-veined. *Petals* similar to posterior sepal, may be very slightly oblique, 16–17 mm. long, 2·75 mm. broad, 5–7-veined; labellum oblong, 3-lobed, 15 mm. long, middle lobe cordate, acute, broadly stipitate, 5 mm. long including stipe, 4·5 mm. broad at broadest part, stipe 2 mm. long, 3 mm. broad, lateral lobes small, triangular, acute, curved towards middle lobe, about 1·5 mm. long; part of lip below lobes 5·5 mm. broad at middle, 3 middle veins extend along middle outwards into 3 fleshy ridges which become triangular erect fleshy lamellae on middle lobe, 1–1·5 mm. tall; sac semicircular in outline, 3 mm. long, 3·5 mm. diameter. *Column* 8 mm. tall without anther, 3 mm. broad, very concave in front, becoming thick and fleshy at base overarching mouth of sac; clinandrium rather deep, irregularly lobed at back and sides; anther 2·75 mm. long to apex, 1·75 mm. broad, oblong with apiculate apex, apex 0·75 mm. long; rostellum a semicircular lobe about 0·5 mm. long. *Ovary* with pedicel 12–13 mm. long.

Doi Sutep, 720–900 m., evergreen jungle; flowers green, lip white and purple, September 26th, *Kerr* 195.

***Ceratostylis siamensis* Rolfe mss.** [Orchidaceae-Epidendreae]; ab affini *C. clathrata* Hook. f., floribus sparse pilosis, labelli forma recedit.

Epiphyte, very small, erect, 1·5–2·7 cm. tall; roots filiform, flexuous, densely pubescent; stem erect, 3·5 mm. tall, completely covered by 5 or 6 membranous, overlapping, triangular acute scales 6–8 mm. long, 3–5-veined. *Leaf* 22 mm. long from joint, 3 mm. broad at broadest part just above middle, solitary, petiolate, jointed, linear, thick fleshy, often conduplicate, ridged on back, apex generally bilobed, largest lobe 0·75 mm. long and rounded, tapering to base. *Inflorescences* 1 or 2 at apex of stem, each single-flowered; peduncle with 2 or 3 membranous overlapping scales at base, 3·5–4 mm. tall, flower bract at apex large, ovate, shortly acuminate, base sheathing, 3·5 mm. long, larger than ovary; flower erect. *Sepals*, posterior almost round, apex fleshy, incurved, base broad, 3·25 mm. long, 1·25 mm. broad at middle and base, sparsely pilose on back, 3 well-marked veins; lateral ovate, oblique, with large concave auricle on side nearest labellum, pilose on back, apex obtuse-rounded, fleshy, slightly incurved, 2·75 mm. long, 2·75 mm. broad across auricle, 3-veined. *Petals* narrowly elliptic, slightly oblique, apex rounded, 2·5 mm. long, about 1 mm. broad, not pilose on back, 3-veined; labellum 3-lobed, side lobes triangular with angles rounded, arising from sides of spur mouth, 0·75 mm. high in middle; middle lobe semi-globular, fleshy, tuberculate, about 1 mm. broad, 1 mm. long, 1 mm. tall; spur 1·5 mm. long to base of lateral lobe. *Column* hardly 1 mm. tall at the sides. *Ovary* and pedicel 3·5 mm. long. *Capsule*, including remains of column, 6 mm. long, 2·25 mm. diameter, 3-angled.

Doi Sutep, 1560 m., on tree in open jungle ; flowers whitish with purple lines ; September 22nd, *Kerr* 213.

Eulophia Burkei *Rolfe mss.* [Orchidaceae-Vandaeae] ; species nova *E. nuda* Lindl. robustior et ab illa labello formae diversae multo maiore distinguenda.

Terrestrial, erect, robust, 54–60 cm. tall ; pseudobulb almost round, 3 cm. long, 2·3 cm. broad ; roots glabrous ; stem entirely enclosed by leaf bases, 20–28 cm. long, with 2–4 membranous, vaginate scales, 6–17 cm. long, apices free for 3–5 cm. *Leaves* 2–3, almost erect, lanceolate, flat or conduplicate, acuminate or obtuse, 20–30 cm. long, 4–6 cm. broad, tapering to long vaginate base probably as long as 12 cm. *Scape* lateral, longer than leaves, glabrous ; peduncle 32–37 cm. long, with 2 membranous, rather loosely sheathing bracts at the base 3–6·5 cm. long, one non-sheathing bract about 2 cm. long ; inflorescence axis 15–27 cm. long, flowers 12, lax ; bracts reflexed, patent and erecto-patent, linear-lanceolate, acuminate, 10–15 mm. long ; flowers erecto-patent, rather large. *Sepals*, posterior lorate, acute, 30 mm. long, 6 mm. broad, rather thick, slightly puberulous on upper and lower surfaces, 7-veined ; lateral rather thick, lanceolate, apex acute, fleshy, base broad and oblique, slightly concave on side nearest labellum, attached chiefly along mouth of spur, 32 mm. long, 9 mm. broad at middle, slightly puberulous on both surfaces, 9 veins. *Petals* oblong-ovate, oblique at base, apex bluntly rounded, rather thick, 25 mm. long, 9·5 mm. broad at middle, puberulous on both surfaces ; labellum broadly oblong-ovate, tapering more abruptly at base, apex truncate-rounded, margin markedly loosely folded, fleshy down middle, ridged at base, 22 mm. long, 17 mm. broad at widest part, 9 mm. broad at base ; spur conical, rounded, slightly oblique, 10 mm. long, mouth wide, with thick fleshy rim on sides, 9 mm. long, 6 mm. broad. *Column* 9 mm. tall at back without anther, base including short foot 3·5 mm. long ; anther 3·5 mm. across, with dark fleshy truncate protuberance 2 mm. long, 1·5 mm. across apex, projecting over stigma ; pollinia pear-shaped, folded, stalk 1·5 mm. long, 1·5 mm. broad, horny, with a horizontal hair-like projection on each side 1 mm. long and a fleshy ridge on lower surface ; clinandrium with a semicircular erect lobe at back. *Ovary* with pedicel 2–3 cm. long.

Doi Sutep, 900 m., open grassy ground near stream ; flowers white-tinged purple, *Kerr* 139.

Distr. Burma, *Burke*, *Kurz* 3247, *Hildebrand*. Yunnan, *Henry* 11141, 12084, 12084a, 13700 *pro parte*.

Eulophia siamensis *Rolfe mss.* [Orchidaceae-Vandaeae] ; *E. campestri* Wall. affinis sed sepalis angustioribus, labelli lobis lateralibus deficientibus differt.

Terrestrial, 31–45 cm. tall ; roots rather stout, flexuous, glabrous ; pseudobulb elliptic, 12–20 mm. long, 6 mm. broad. *Leaves* 2–4, linear, often conduplicate, tapering to long narrow

apex and also to base, bases closely overlapping, 15-30 cm. long., about 5 mm. broad. *Scape* lateral, very long, slender, 30-42 cm. tall; peduncle with 3 or 4 long sheathing bracts, 2.5-5 cm. long, inflorescence axis 3.5-10 cm. long, 2-4 flowers, lax; bracts lanceolate, tapering, generally erecto-patent, occasionally reflexed, 5-13 mm. long; flowers erect or reflexed. *Sepals*, posterior linear, acute, 19.5 mm. long, 2 mm. broad; lateral linear-obovate, shortly acuminate, 22 mm. long, 2.25 mm. broad at widest part, 1.5 mm. broad at middle, base narrow with margins incurved. *Petals* narrowly oblong, rounded or truncate-rounded, 13 mm. long, 4 mm. broad; labellum ovate at base becoming oblong beyond middle, slightly expanding again near apex, apex truncate-rounded, irregularly crenate, margins wavy, 15 mm. long, 6.5 mm. broad at ovate part, 4.5 mm. broad at narrowest part and 6 mm. broad below apex; spur narrow, curved, rounded at tip, 6.5 mm. long, 1.25 mm. broad. *Column* semi-terete, 5.5 mm. tall at back without anther. *Ovary* with pedicel 2 cm. long.

Doi Sutep, 300-600 m., among grass in eng jungle, August 8th, Kerr 107.

Cymbidium Kerrii Rolfe mss. [Orchidaceae-Vandae]; *C. lancifolio* Hook. f. peraffine, labello latiore differt.

Terrestrial, about 45 cm. tall; roots stout, glabrous; stem 11-15 cm. tall, branched, covered by overlapping leaf bases which become membranous and toothed at the end (teeth 0.5-1 mm. long), 5-6 cm. long; internodes 0.6-1.5 cm. long. *Leaves* 7, petiolate, lanceolate, acuminate, tapering to base which is often conduplicate, 13-22 cm. long, 2.7-3.1 cm. broad, 3 main veins, petiole to toothed base 2.5-8.5 cm. *Inflorescence* axis lateral, glabrous, about 6 cm. long, 3-4-flowered, lax; bract broadly ovate, shortly acuminate, sheathing at base, 11.5 mm. long, 7 mm. broad; flowers large, erect or almost patent. *Sepals*, posterior lorate, slightly broader near rounded apex, 17.5 mm. long, 4.5 mm. broad at broadest part, tapering to 3 mm. broad at base; lateral similar to posterior but with fleshy mucro on back at apex, 16 mm. long, 3.5 mm. broad at broadest part, tapering to 2.5 mm. at base. *Petals* narrowly ovate, oblique, apex probably obtuse, 15.5 mm. long, 5 mm. broad; labellum rounded at base, then ovate, apex rounded, 16 mm. long, 7 mm. broad in ovate region, 11 mm. broad at top of rounded part, two curved fleshy ridges from base to beyond middle increasing in height and thickness away from base, 9 mm. long, 3.5 mm. apart at widest area. *Column* semi-terete, curved, 12 mm. tall at sides not including anther, slightly concave in front; stigma 2.5 mm. across, 1 mm. long, clinandrium small, suberect lobe at back, 3 short triangular lobes projecting over stigma, side ones larger than middle; anther suborbicular, puberulous, about 1.5 mm. in height. *Ovary* with pedicel 2.4-2.8 cm. long.

Doi Sutep, 1200 m., on humus near stream in thick evergreen jungle (only one plant seen); sepals whitish, petals white with median longitudinal purple band, lip white, streaked and spotted purple; May 2nd, *Kerr* 227.

Cymbidium siamense *Rolfe mss.* [Orchidaceae-Vandaeae]; *C. ensifolio* Swartz affine sed perianthii segmentis magis obtusis, petalis latioribus distinguendum.

Terrestrial, 65–75 cm. tall; roots stout, flexuous; stem erect, 1.5–3 cm. tall, enclosed by leaf bases and covered with membranous lanceolate scales 4–10.5 cm. tall. *Leaves* 3–7, up to 75 cm. long, 12–17 mm. broad at widest part, linear-lanceolate, acute, margin entire, tapering gradually to narrow base of which lower part conduplicate, expanding again to form short vagina about 1 mm. long, 3 main veins. *Scape* erect, lateral, lax, much shorter than leaves, 18–29 cm. long, with 3 or 4 lanceolate, acuminate, membranous, sheathing bracts at base, 2–3 flowers; flower bracts narrowly ovate, acute, 6–18 mm. long, very much shorter than ovary; flower erect or erectopatent. *Sepals*, posterior narrowly elliptic, apex obtuse-rounded and very shortly acuminate, somewhat fleshy, 21.5–23.5 mm. long, 7.5–8 mm. broad, 5-veined; lateral narrowly oblong, very slightly curved, apex obtuse-rounded and shortly sharply apiculate, somewhat fleshy, 21.5–24.5 mm. long, 6.5 mm. broad, 5-veined. *Petals* ovate, somewhat fleshy, apex round, slightly incurved, with a small fleshy papilla on back, 17.5–19.5 mm. long, 9–10 mm. broad; labellum broadly elliptic, auriculate, apex obtuse-rounded, auricles very fleshy, probably erect, with 2 callus ridges, 15 mm. long, 8.5 mm. wide above auricles and 10–12 mm. wide across auricles when latter flattened out, 7-veined. *Column* stout, fleshy, about 10 mm. tall without anther, slightly produced into a foot. *Ovary* with pedicel 3–4.5 mm. long. *Capsule* including pedicel and remains of column 6 cm. long, pedicel about 1 cm., column persistent.

Doi Sutep, 600 m., evergreen jungle, April 23rd, *Kerr* 242.

Cymbidium sutepense *Rolfe mss.* [Orchidaceae-Vandaeae]; *C. Dayano* Reichb. f. affine sed floribus maioribus ab illo recedit.

Epiphyte, erect, about 87 cm. tall; stem short, about 5 cm. tall, covered by closely overlapping leaf bases and a few leafy scales 12–15 cm. long. *Leaves* many, very long and narrow, tapering to base and apex, apex truncate or subacute, base jointed and toothed at joint, 30–71 cm. long from joint, 10.5 mm. at broadest part, margin entire, portion between joint and vagina rather deeply ridged, 7–9.5 cm. long, vagina partially sheathing, 3–4 cm. long. *Inflorescence* axis 16–25 cm. long, laxly few-flowered; bracts triangular, acuminate, 4.5–6 mm. long; flowers nearly 6.5 cm. long including ovary. *Sepals*, posterior lanceolate, apiculate, apex curved, base slightly curved, 30 mm. long, 7 mm. broad at middle; lateral similar to posterior but narrower, 30 mm. long, 5.5 mm. broad.

Petals lanceolate, very shortly apiculate, 23 mm. long, 4.5–5.5 mm. broad; labellum 3-lobed, 2 cm. long, 1.3 cm. across side lobes at widest part, side lobes diverging, elliptic, apex truncate-rounded, 14 mm. long, 3.5 mm. broad at free part; middle lobe broadly ovate, fleshy, apex bluntly rounded but with fleshy mucro on back, free part of lobe 8.5 mm. long, 7 mm. broad, two parallel fleshy ridges extending from base to half length of labellum, nearly 1.5 mm. apart. *Column* 13 mm. tall without anther, semiterete, slightly curved, expanded at base. *Ovary* with pedicel 3.3–3.6 cm. long. *Capsule* and remains of column 5.5–6 cm. long; pedicel 2.5–3 cm. long.

Doi Sutep, 1260 m., on trees in evergreen jungle, September 4th, *Kerr* 113.

***Geodorum siamense* Rolfe mss.** [Orchidaceae-Vandaeae]; *G. purpurascens* Br. affine sed floribus luteis multo minoribus ante folia evolutis differt.

Terrestrial, 13.5–22 cm. long, roots stout, probably grooved, glabrous; pseudobulbs 1.5–2 cm. long and 1–1.5 cm. broad; stem about 5 cm. long, covered by overlapping leaf bases and scales, the lower ones completely sheathing. *Leaves* lanceolate, acute, sheathing at base, 3–5.5 cm. long, 9–11 mm. broad. *Scape* lateral, rather stout, drooping, glabrous, 15.5–22 cm. long; peduncle 11–17 cm. long, with 3 membranous sheathing bracts 2–3.5 cm. long; inflorescence axis 1.75–4 cm. long, subdensely flowered; bracts erecto-patent or occasionally reflexed, lanceolate, acuminate, 12 cm. long, decreasing in size towards apex of axis. *Sepals*, posterior elliptic, acute, margin of apex incurved, 7 mm. long, 2.25 mm. broad, 5-veined; lateral narrowly ovate, acute, base oblique, 7 mm. long, 3 mm. broad, margin at apex incurved, 5-veined. *Petals* ovate, apex almost rounded, 7.5 mm. long, 3.5 mm. broad; labellum almost round, deeply concave, 7.5 mm. long, 7.5 mm. broad at widest part, middle lobe oblong, apex truncate-rounded, 2.25 mm. long, 4 mm. broad, base ridged on back of saccate part. *Column* 3.5 mm. tall at back without anther. *Ovary* with pedicel 6.5 mm. long.

Doi Sutep, lower slopes, 300–450 m., deciduous jungle; flowers yellowish, May 2nd, *Kerr* 30.

***Luisia latilabris* Rolfe mss.** [Orchidaceae-Vandaeae]; labello saccato *L. inconspicuae* Hook. f. similis sed foliis longioribus, floribus multo maioribus recedit.

Erect *epiphyte*, 10–51 cm. tall; roots rather stout, somewhat flexuous, warty, sometimes more or less flattened; stem simple, terete, about 3.5 mm. diameter, vaginae longitudinally striate, scarcely or very slightly overlapping, internodes 1–2.5 cm. long. *Leaves* long, slender, terete, straight or very slightly recurved, apex subacute or obtuse, glabrous, 6.5–11.5 cm. long, 1.75 mm. diameter. *Inflorescence* very short, stout, dense-flowered (6 or more flowers at tip), 1–1.5 cm. long, breaking through vagina;

bracts overlapping, broadly deltoid, rather thick, amplexicaul, somewhat concave, shorter than pedicel and ovary, 1.5–2 mm. high, furfuraceous on back; flower about 8 mm. long. *Sepals*, posterior oblong-ovate, apex truncate-rounded, slightly incurled, 3.75 mm. long, 2.25 mm. broad, very slightly shorter than petals, 1 main vein and 2 very short veins, furfuraceous on back; lateral linear-oblong, slightly oblique, apex hooded and somewhat fleshy, 4–4.5 mm. long, 1.5 mm. broad, 1-veined, furfuraceous on back. *Petals* oblong-ovate, slightly oblique, apex rounded, 4 mm. long, 2.5 mm. broad, 3-veined, furfuraceous on back; labellum saccate at base; lip oblong-ovate, with well marked auricles, rounded or truncate-rounded at apex, somewhat fleshy, faintly irregularly rugulose, grooved down middle near base, 3.5–4 mm. long, 4–4.5 mm. across auricles and 2.5 mm. across above auricles; auricles or side lobes obtuse, rounded, 1.5 mm. high. *Column* short, broad, 2 mm. high at back, 1.25 mm. broad, continued at base into short foot formed by 2 thick cylindrical calli continued on to base of labellum with deep groove between, about 1.25 mm. long and 0.75 mm. broad; clinandrium 2 slight depressions on each side of slight rather high ridge which tapers at back; rostellum not prominent, fleshy irregular flap overhanging stigma; anther 0.75 mm. high from side, grooved down middle, trilobed, depressed, undulate in front, mid lobe largest, obtuse and slightly upturned at tip, 1.25 mm. across, nearly 1 mm. long (down groove); pollinia 2, suborbicular; stalk spathulate, slightly dilated at broad end where pollinia attached; gland rather large, oblong, rounded at one end, shortly 2-lobed divergent at other end, about 0.5 mm. long, stalk about 0.75 mm. long. *Ovary* with pedicel 5–6 mm. long, curved at junction with sepals.

Near Lampang, Mè Tan, 450 m., on trees in mixed jungle; perianth green-tinted purple, lip deep purple, May 9th, *Kerr* 302.

Luisia siamensis Rolfe mss. [Orchidaceae-Vandae]; ab affini *L. trichorhiza* Blume perianthii segmentis patulis, sepalis lateralibus obtusis conspicue carinatis, epichilio magis angulari reedit.

Epiphyte, erect, stem curved, about 18 cm. long, branched; roots rather stout, glabrous. *Leaves* long, slender, terete, obtuse, 8–12 cm. long, about 2 mm. diameter; leaf bases very little or hardly overlapping, irregularly slightly longitudinally rugulose, 15–20 mm. long, 4–5 mm. diameter. *Inflorescence* racemose, breaking through vagina, 1 mm. or under in length, stout, dense flowered near apex (about 5 or more), lower part with many large overlapping bracts; perianth segments spreading. *Sepals*, posterior rather narrowly oblong-ovate, rounded at apex, 3–3.5 mm. long, nearly 2 mm. broad, 3-veined; lateral broadly oblong-ovate, oblique, obtuse or slightly hooded, prominently keeled on apex at back, about 4 mm. long and 2.75 mm. broad, 4-veined. *Petals* linear-oblong, slightly oblique, rounded at

apex, 4–5 mm. long, 1.25 mm. broad, 3-veined; labellum 5 mm. long, epichile pentangular, fleshy, 2.5 mm. long, 3.5 mm. broad; apex and side angles obtusely rounded; indentation between epichile and hypochile very slight. hypochile thick fleshy, grooved down middle, 2.5 mm. long, 3 mm. broad. *Column* 2.5 mm. high at back, short, stout, fleshy, 1.25 mm. across stigma; stigma large, deep; clinandrium shallow, higher at back; rostellum inconspicuous; pollinium rather large, almost rounded, slightly flattened, 0.75 mm. long; stalk very short and broad, rounded at end attached to pollinia and with broad disc attached at right angles to other end (disc rounded at one end, angled at other). *Ovary* with pedicel 6–7 mm. long.

Near Chiangmai, Mè Sui, 450 m., on small trees in marsh savannah; lip and column pale green, petals and sepals with reddish tint, scented; April 7th, *Kerr* 298.

In Parish's orchid drawings (ii. K. 21, mss.) there is a plant apparently identical with ours; it was enumerated by Parish and Reichenbach (Trans. Linn. Soc., xxx. p. 135) as *L. platyglossa* Reichb. f., but *L. platyglossa* Reichb. f. is synonymous with *L. trichorhiza* Blume, Reichenbach (Walp., Ann., vi. p. 622) citing Bot. Mag. t. 3648 for both plants.

Diploprora truncata Rolfe mss. [Orchidaceae-Vandaeae]; species labello apice truncato distincta.

Epiphyte, erect, stem about 10.5 cm. tall and 3 mm. diameter; roots fairly stout, glabrous; vaginae with scattered pubescence, rugulose, slightly overlapping, internodes 7–10 mm. long. *Leaves* thick, linear, tapering slightly to apex and base, apex rounded, 4.5–7.2 cm. long, 7–9.5 mm. broad, margin irregularly curled (may be due to drying), glabrous. *Inflorescence* breaking through vagina, long, rather slender, with scattered pubescence especially near base, 2 or 3 completely sheathing bracts near base (first 2 close together); peduncle 5–6 cm. long, whole axis up to 17 cm. long, lax-flowered (10 or more), internodes about 1 mm. long; flower bract narrowly triangular, acute, keeled on back, 4 mm. long, 2 mm. broad at base. *Sepals*, posterior narrowly oblong-obovate, obtuse, apex fleshy and slightly hooded, 6.5 mm. long, 2.5 mm. broad across broadest part, faintly margined, 3-veined, irregularly rather markedly rugulose; lateral spathulate, oblique, subacute, apex fleshy and very slightly flatly keeled, 6 mm. long, 2.25 mm. broad at broadest part, 3 main veins. *Petals* obovate to slightly spathulate, curved, apex rounded, 5.5 mm. long, 2–2.5 mm. broad at broadest part, 3 main veins; epichile vertical, curved, keel-shaped, with horizontal inverted triangular outgrowth at apex; angles of truncate apex also truncate; keel broadened and fleshy where joining the mesochile; whole epichile about 6 mm. long; depth of keel 1.5 mm., width of truncate apex 1.5 mm.; hypochile almost semi-orbicular (when flattened out), deeply concave with sides almost erect, large fleshy lamella down middle; mesochile

3.5 mm. long, each side 3 mm. high at highest part; lamella 1.5 mm. high. *Column* 2.5 mm. high at back, about 1.25 mm. across; clinandrium almost round, slight ridge down middle, fairly deep; rostellum inconspicuous, fleshy, narrowing slightly to free end which appears irregularly lobed; stigma about 1 mm. long, 0.75 mm. across; anther almost round, 1.25 mm. long, not very high, grooved down middle, truncate, widely and shallowly emarginate at apex. *Ovary* with pedicel about 4.5 mm. long. *Capsule* reflexed, 3.5-nearly 4 cm. long, 6.5 mm. diameter; pedicel about 5 mm. long; bracts persistent; perianth fairly persistent.

Doi Sutep, 1650 m., on trees in evergreen jungle; sepals and petals pale green; lip with purple middle lobe, side lobes white tinged yellow towards base, and spotted deep purple internally; callus green; column white; February 25th, *Kerr* 270.

Sarcochilus sutepensis *Rolfe mss.* [Orchidaceae-Vandeae]; a *S. leopardino* Parish et Reichb. f. foliis diversis, labelli lobis lateralibus multo minoribus, calcare maiore differt.

Epiphyte, erect, roots slightly flexuous, glabrous; stem 15.5 cm. tall, leafy area 4.5 cm. long, internodes short, densely leafy. *Leaves* 6, lorate, tapering slightly to base and apex, glabrous, apex unequally shortly bilobed, each lobe rounded and shortly irregularly crenate, 9-16.5 cm. long, 2-2.2 cm. broad, narrow lamella down middle of back extending from leaf base to apex and rounding off with larger lobe, slight groove down middle on upper surface; leaf base loose, sheathing, glabrous, overlapping, irregularly longitudinally lamellate, 1.8-2.4 cm. long. *Scape* much shorter than leaves, often 2 arising at a node, breaking through leaf base, 5-8 cm. long, rather stout, glabrous, fleshy, slightly winged near apex, lax-flowered, peduncle 3-5 cm. long, with 1-3 very loose sheathing bracts, flower intervals 3-4 mm.; flower bracts broadly deltoid, obtuse, slightly keeled at apex, 4-5 mm. long, very slightly fimbriated margin, amplexicaul; flower 1.8-2 cm. long. *Sepals*, posterior rather broadly ovate, apex markedly keeled on back (keel nearly 0.75 mm. high), hooded, base rather broadly attached, 9 mm. long, 5 mm. broad, 5-6-veined; lateral broadly oblong-ovate, obtuse or sub-acute, slightly hooded, keeled on back near apex, 9 mm. long, 5.5-6 mm. broad, 7-veined. *Petals* suboblong, very slightly oblique, apex obtuse, fleshy, 8.5 mm. long, 3 mm. broad; labellum with short claw, small rounded sac and fan shaped lip, claw 3 mm. long to lateral sepal, flanges from column continued along foot and claw, sac small, fleshy, 1.5-2 mm. across, with large fimbriated flange in centre; lip when flattened out 6 mm. long, 7.5 mm. broad at widest part, markedly keeled down back, keel 1.5 mm. broad, apex undulate, truncate callus 1 mm. long, 1.25 mm. broad in middle of lip, 3-4 veins on each side. *Column* about 1.25 mm. tall at back without anther, long foot, flanged

on sides. *Ovary* 8–10 mm. long. *Capsule* 7.4 cm. long, 0.5 cm. diameter.

Doi Sutep, 1500–1650 m., on trees in evergreen jungle, June 4th, *Kerr* 183.

Aerides flabellatum *Rolfe mss.* [Orchidaceae-Vandeae]; species nova ob labellum flabelliforme distincta, ad gregem *A. falcati* Lindl. pertinens.

Epiphyte, erect, robust; roots very long, branched, stout, occasionally slightly flattened, glabrous; stem about 13 cm. long, upper part (4 cm.) densely leafy, internodes 3–4.5 mm. long. *Leaves* in 2 lateral rows, patent, curved, conduplicate, keeled, lorate, hardly or not tapering at apex, not contracted at leaf base, 7–10.5 cm. long, 1.3–1.5 cm. broad, glabrous, apex slightly unequally 2-lobed, each lobe more or less obliquely truncate and irregularly 3-lobed, leaf bases overlapping, finely longitudinally striate, completely sheathing near base, about 1.3 cm. long. *Inflorescence* 6–13 cm. long, lax-flowered; bract intervals about 1.5 cm. long; bract broadly triangular, slightly concave, apex obtuse, about 3.5 mm. long; flowers large. *Sepals*, posterior broadly ovate, apex truncate, 7.5 mm. long, 5 mm. broad, 7-veined; lateral broadly cordate, oblique, apex subacute, 7.5 mm. long, 8.5–9 mm. broad at widest part. *Petals* similar to posterior sepal, apex acute, slightly oblique, 7 mm. long, 4.5 mm. broad, 7-veined; claw of labellum channelled, about 11 mm. long, sides erect, 0.5 mm. deep, increasing in depth toward spur until 2.5 mm. deep, with 2 longitudinal fleshy ridges inside; side lobes arising on sides of claw, oblong, apex rounded, curved, projecting inward and towards column, 2.5–3 mm. long, 1.75 mm. broad; middle lobe arising from front of spur, consisting of fleshy puberulous isthmus and a puberulous flabelliform fimbriated lobe; isthmus about 11 mm. long, with 2 erect fleshy longitudinal flanges 1–1.5 mm. high on upper surface; lobe about 10 mm. across at base and 6–7 mm. long; spur cylindrical, rounded, curled upward towards labellum lobe, nearly 10 mm. long, 2–3 mm. diameter. *Column* 1 mm. tall at back without anther, 2.5 mm. tall in front; foot 1.5 mm. long; clinandrium sloping, ridged in centre; stigma deep-seated, whole column hollowed in front; anther oblong-cordate, apex broadly truncate, about 1.5 mm. high at back, 3.5 mm. long, 3.5 mm. broad; pollinia almost orbicular, slightly compressed, stalk strap-shaped, hooded at pollinia end, 2 mm. long nearly 1 mm. broad; gland large. *Ovary* and pedicel indistinguishable, 16–17 mm. long.

Doi Sutep, 360 m., on trees in eng jungle; sepals and petals reddish-brown, lip white with purple blotches; May 12th, *Kerr* 275.

Saccolabium hoyopse *Rolfe mss.* [Orchidaceae-Vandeae]; a *S. disticho* Lindl. foliis latioribus magis carnosius, scapo multo brevior, labelli lobo mediano pro rata minore recedit.

Epiphyte 36 cm. tall, branched, rather slender, leafy; internodes 4–6 mm. long. *Leaves* distichous, shortly vaginate, blade lanceolate, fleshy, tapering to apex which has 3 setae (median 1–2 mm. long, 2 lateral 0.5–1 mm. long), tapering at base, 16–24 mm. long, 4–6 mm. broad, edges slightly recurved, upper surface wrinkled, middle vein showing a fairly well marked depression; vaginae same length as internodes (4–6 mm.), closely sheathing stem. *Inflorescence* in axil of leaf, piercing vagina (at level of leaf below), 2-flowered (perhaps more); peduncle 8–11 mm. long, with, at base, a scale entirely sheathing, then one or two partly sheathing; flower bract small, slightly concave, apex acute or rounded; flower including ovary and pedicel 9 mm. long; sepals and petals free and alike. *Sepals*, posterior slightly concave, lateral slightly curved, narrowly ovate, with rounded apex, 3.5–4 mm. long, 1.5 mm. broad, 1-veined. *Petals* rather smaller, narrow, slightly obovate, rounded at apex, 3 mm. long, 1.25 mm. broad, 1-veined; labellum saccate, with small fleshy cordate lip rounded or truncate at apex, 2 mm. long, 1.5 mm. broad, 5-veined; sac large, rounded, 3.5–4.5 mm. long, 3–4 mm. across; on either side of mouth of sac a very slight obtuse rounded flap. *Column* nearly 1.5 mm. high, 1.25 mm. thick, expanded toward tip giving rather broad clinandrium, somewhat broadly winged on each side of stigma; clinandrium raised in centre, with groove sloping down toward rostellum, 1.25 mm. high, 1 mm. broad; rostellum of 2 short, pendant, narrow, pointed lobes, about 0.5 mm. long; stigma beneath rostellum, rather deeply set, occupying practically whole length of column; pollinia round, with 1 depression away from point of attachment, about 0.5 mm. diameter; horny attachment about 1 mm. long, strap-like with incurled edges tapering toward gland; gland nearly 1 mm. long, 2-pronged at one end. *Ovary* narrowing to short pedicel, whole about 5 mm. long. *Capsule* obovoid, grooved, 5 mm. long, 4 mm. diameter; pedicel about 3.5 mm. long.

Doi Sutep, 1650 m., on trees in evergreen jungle (only one plant seen), flowers green; June 27th, *Kerr* 231.

***Saccolabium monticolum* Rolfe mss.** [Orchidaceae-Vandaeae]; a *S. intermedio* Griff. et *S. acutifolio* Lindl. pedunculis crassioribus, floribus minoribus recedit.

Epiphyte, rather large, about 27 cm. tall, stem densely leafy, roots rather stout, glabrous, internodes 1.5–2 cm. long. *Leaves* flat, patent, broadly lanceolate, with loose funnel-shaped sheathing base, lamina 9.5–13 cm. long, 1.5–2.5 cm. broad, apex acute, base hardly tapering, sheathing base 15–18 mm. long, 9 mm. broad, not overlapping. *Peduncles* stout, breaking through sheathing base, with 2 or 3 short, loosely sheathing bracts 3–4 cm. long; inflorescence sub-corymbose, 4–6-flowered, lateral; flower bract short and wide, rather thick rounded apex, concave, enclosing lower side of pedicel, 1.5 mm. high, 2.5 mm.

wide ; pedicel and ovary 10–14 mm. long, fairly stout, ribbed. *Sepals*, posterior slightly obovate, rounded or truncate-rounded at tip, 6–7 mm. long, 3–3.5 mm. broad, thick fleshy, incurved ; lateral thick, narrowly ovate, broadly stipitate, 6.5 mm. long, 2.5 mm. broad. *Petals* thick, lanceolate, truncate-rounded at apex, 5.5 mm. long, 2 mm. broad ; labellum saccate, rather prominently ridged, 4 mm. long, 3 mm. broad, 2.5 mm. deep (saccate part) ; two small triangular side lobes with rounded apex less than 1 mm. high ; middle lobe broadly triangular, fleshy, edges thin and erose, prolonged into wings at the sides which enclose the side lobes, surface rugulose, 2.5 mm. long, 5 mm. broad including wings, wings slightly over 1 mm. broad. *Column* broad, 2 mm. high (3.25 mm. including anther), with 2 fleshy expansions, about 2.5 mm. broad altogether, attached at base to labellum spur ; clinandrium slightly raised, ridged in centre, groove in front leading to rostellum which consists of 2 narrow pointed lobes about 1 mm. long, hanging over stigma ; stigma large round cavity lying between fleshy lobes of column, occupying greater part of front of column ; anther cordate, slightly apiculate (broad triangular apex), nearly 3 mm. across and 2.25 mm. from apex to back ; pollinia almost completely round, with slight depression at one point, elastic caudicle very short, horny attachment 2 mm. long, expanded and rounded at pollinia end, strap-like and incurled until reaching gland ; gland 1 mm. long, oblong, rounded at one end, 2-pronged at other. *Ovary* and pedicel practically indistinguishable in flower. *Capsule* large, 2.25 to nearly 4 cm. long, 6–7 mm. diameter ; fruit pedicel 6–10 mm. long.

Doi Sutep, 1500 m., on trees in evergreen jungle ; perianth yellowish with pink spots, lip white with fine pink spots and yellow patch on disc, column pink, October 10th, *Kerr* 206.

A Yunnan plant, *Henry* 12958, probably belongs to this species. The leaves are rather smaller and the pedicels more slender, otherwise it agrees well with our plant.

***Saccolabium spatulatum* Rolfe mss.** [Orchidaceae-Vandaeae] ; a *S. gemmato* Lindl. foliis latioribus, labelli lobo mediano spatulato recedit.

Epiphyte 13 cm. long, curved, branching near base, with rather large root system ; stem completely sheathed by leaf bases. *Leaves* tending to come off on one side of stem in one plane, generally curved, rather long-linear with sheathing base ; lamina folded inward longitudinally, very slightly tapering at apex and base, apex 3-angled, 1 angle rounding off sooner than other 2, therefore appears emarginate, 9–11.5 cm. long, 8–10 mm. broad ; vagina rather closely sheathing all round, 9–15 mm. long (equal to the internodes). *Inflorescence* longer than leaves, long, slender, branching (about 6 branchlets on each peduncle), arising in axil of leaf, not piercing vagina, 16–20 cm. long, peduncles with closely sheathing scales, ultimate flowering peduncles

(racemose) 7 cm. long; flowers small, numerous; flower bract small, reddish, triangular, acute to acuminate, slightly concave, slightly over 1 mm. long; flower about 5 mm. long including ovary (ovary hardly twisted: labellum posterior: sepal anterior). *Sepals*, anterior ovate, apex truncate-rounded, 1.5–1.75 mm. long, 0.75–1 mm. broad, 1-nerved; lateral oblong, slightly curved, shortly stipitate, apex rounded, 2 mm. long, 1 mm. broad, 1-nerved. *Petals* obovate, truncate, slightly emarginate or undulate, 1.25–1.5 mm. long, less than 1 mm. broad, 1-nerved; labellum with conical spur 1.75–2 mm. long; middle lobe of lip spathulate, 2.5–3 mm. long, 1.75 mm. broad, side lobes shallow, oblong, slightly rounded (on stalked part of middle lobe), stalked part canalled, 1.5 mm. long, 0.75 mm. broad. *Column* 0.5–1 mm. long; pollinia rounded; attachment very short; gland rather large at right angles to attachment, just longer than diameter of pollinia. *Ovary* about 3 mm. long, at right angles to axis, curved.

Doi Sutep, 1350–1650 m., on trees in evergreen jungle; flowers purple; May 2nd, *Kerr* 178.

Saccolabium sutepense *Rolfe mss.* [Orchidaceae-Vandae]; a *S. monticolo* Rolfe internodiis brevioribus, vaginis imbricatis, labelli lobo mediano magis rotundato vix lateraliter producto differt.

Epiphyte, short-stemmed, 4–7 cm. tall, leafy; roots rather stout, flexible and glabrous; internodes 1–1.75 cm. long. *Leaves* long, flat, lanceolate, with short rather loose sheathing base; lamina 13 to nearly 22 cm. long, 1.5–2.2 cm. broad, tapering to rather long acute apex and to base; sheathing bases longitudinally ridged, generally slightly overlapping, 1–1.5 cm. long, 0.5 cm. broad. *Peduncles* lateral, breaking through sheathing base, rather long and slender, 4.5–5 cm. long without sheathing bracts; area with flower bracts 5 mm. long. *Sepals*, anterior narrowly obovate, tapering to base, apex rounded-acute, 5.5 mm. long, 2 mm. broad at broadest region, fleshy especially near apex, flange running longitudinally down middle of back (may be due to fleshiness only), and in front along middle of outer half; lateral narrowly oblong, slightly narrower at base, oblique, truncate-rounded at apex, 5 mm. long, 2 mm. broad, veins 3 down centre, slight fleshy ridge down middle on back, especially pronounced near apex where it appears like a flange. *Petals* linear-oblong, stipitate, truncate-rounded at apex, slightly oblique, shorter than sepals, 4.5 mm. long, 1.5 mm. broad, 3-veined, probably slightly fleshy; labellum about 5 mm. long and 4.5 mm. deep including side lobes, middle lobe cordate, rounded or truncate-rounded at apex, very slightly produced into side angles, fleshy, with fimbriate margin, 3 mm. long along middle, 3 mm. broad to margins; spur saccate, nearly semi-orbicular, slightly over 3 mm. diameter, mouth wide, with triangular lobe on each side more than 1 mm.

deep, rather prominently ridged along veins of spur. *Column* 2.5 mm. high without anther, about 2 mm. broad, fused to spur of labellum almost throughout its whole length; clinandrium broad, semi-orbicular, almost 3 mm. across, projecting ridges in centre ending in conical projection hooded on side toward gland; rostellum bilobed, lobes 1 mm. long; stigma deep-seated, with projecting fleshy ridge below.

Doi Sutep, 1400 m., on trees in evergreen jungle, November 20th, *Kerr* 267.

Sarcanthus bicuspidatus *Rolfe mss.* [Orchidaceae-Vandaeae]; ab affini *S. insectifero* Reichb. f., foliis minoribus carinatis, labelli lobo mediano apice in processum bicuspidatum excurrente floribus maioribus recedit.

Epiphyte, pendulous, about 23.5 cm. long, branched and rooting at intervals, roots fairly stout, glabrous, rather stiff, upper part of stem (5 cm.) densely leafy, lower part completely clothed in leaf bases, internodes 7–10 mm. long. *Leaves* almost patent, pectinate, slightly curved, amplexicaul, lamina narrowly ovate, conduplicate, 2.2–2.5 cm. long, 6.5 mm. broad from keel to margin, but where leaf is open about 8 mm. across, deeply keeled on back, a rather prominent ridge down middle of back on each side, edges and keel margined, thickly coriaceous with 2 narrow ridges down centre inside, apex unequally bilobed, each lobe truncate-rounded; vaginae longitudinally ridged, closely sheathing stem, overlapping, 7–15 mm. long, 5 mm. broad, lamina obliquely cut from vagina. *Inflorescence* racemose, lateral, breaking through base of vagina, axis much shorter than leaves, 10–11 mm. long, with large completely sheathing bracts at base which are rather deeply concave, bracts towards apex not completely encircling axis; flower bract widely triangular, apex acute, 2.5 mm. long, 4 mm. broad at base, much shorter than ovary, 1-veined, ribbed down centre back; flower medium sized. *Sepals* probably spreading; posterior erect, rather broadly ovate, hardly tapering at base, concave, apex rounded to truncate-rounded, 5 mm. long, 3 mm. broad, 7–8-veined, only middle vein running to apex; lateral similar, oblique, apex rather more acute, 5–5.5 mm. long, 3.5 mm. broad, fleshy, 9-veined, middle one only running to apex. *Petals* narrowly ovate to obovate, apex rounded or acute, shorter than sepals, 4 mm. long, 2 mm. broad, 3-veined; labellum trilobed, lateral lobes triangular, thick, erect (but bent towards middle lobe), arising from sides of mouth of spur, about 2 mm. high, apex blunt or rounded, slightly incurled; middle lobe large, 3–3.5 mm. long (excluding projection), 4.5 mm. broad (near base), fleshy, cordate, slightly concave, fleshy cushion in centre, a rather deep groove on each side, side angles rounded, apex with thin wedge-shaped projection which splits into 2 pointed lobes, projection 2.5–3 mm. long (to points); spur slightly curved, conical, 2-lobed, each lobe subrounded at end, 6.5 mm. long (from

junction with column), inside at back is oblong fleshy callus with truncate apex bent slightly back towards column, 2.5 mm. long, 1 mm. broad at apex, inside at front is fleshy conical projection in continuation with septum dividing spur. *Column* broad, attached to spur near base, height nearly 2 mm., breadth across stigma 2.5 mm.; a fimbriated projection at each side at junction of column and spur; stigma large and rather deep, practically whole length of column, slightly projecting lip on lower side; anther quadrangular (broad face in front, narrow face where attached to column), 2 mm. long along middle line, 2.75 mm. broad at widest part, 1 mm. deep at back, depressed in front; pollinia globose, 0.75 mm. diameter, stalk broad, horny, oblong, 2-tiered, upper tier smaller, 4 angles projecting towards pollinia, pollinia attached in centre of upper tier, nearly 3 mm. broad at widest part, 1 mm. long along middle; rostellum of widely separated lobes at outer angles of clinandrium; there are 2 lobes at each side, lower short and rounded, upper long, thread-like, curled, and projecting upward, 2-2.5 mm. long. *Ovary* and pedicel indistinguishable, 1.5-1.9 cm. long.

Chiengmai, Mê Sui, 420 m., on trees in mixed jungle; sepals green with five brown lines; petals white with faint mauve tint, lip yellow, column white; August 8th, *Kerr* 151.

Sarcanthus crassifolius *Rolfe mss.* [Orchidaceae-Vandae]; a *S. laxo* Reichb. f., cui affinis foliis brevioribus crassioribus, inflorescentia erecta pauciflora recedit.

Epiphyte, short-stemmed, 2.5 cm. long; roots long, filiform, flexuous, glabrous; stem densely clothed with leaves. *Leaves* almost patent, pectinate, thickly coriaceous, fleshy, keeled, linear, conduplicate, unequally bluntly bilobed (one lobe much shorter and narrower than the other), 3-4 cm. long, 0.5 cm. broad (from keel to margin); leaf bases closely overlapping, about 4 mm. diameter and 5 mm. long. *Inflorescence* lateral, erect, few-flowered, axis slender, about 2.3 cm. long, bract at base completely sheathing; flower bracts small, triangular, acute, concave, 1.5 mm. long; flowers medium sized. *Sepals*, posterior rather narrowly ovate, fleshy, concave, truncate-rounded at apex, 7 mm. long, 2.5 mm. broad, 3-veined; lateral similar but slightly oblique (narrowly ovate one side, narrowly obovate other side), and not concave, 6.5 mm. long, 2.5 mm. broad. *Petals* like lateral sepals, but narrower, only very slightly curved, 6 mm. long, nearly 2 mm. broad; labellum conical, trilobed (forming rather wide scoop), 6.5 mm. long, 6.5 mm. broad, middle lobe fleshy, large, cordate, rounded apex, 2.5-3.5 mm. long, 3.5-4 mm. broad; side lobes very small, arising between middle lobe and truncate margin of spur, conical, acute, curved and curling over mouth of spur, about 1 mm. long, rest of margin of spur smooth, truncate, fleshy; spur 2-lobed at base, conical, at first narrow, widening out abruptly above middle towards middle lobe, rounded at tip; inside at

back is semi-orbicular flattened callus, grooved down narrow face, 1.5 mm. long, projecting into spur ; inside at front callused ridge connected with thin septum, the ridge ending in pointed projection about 1 mm. long at base of middle lobe of lip. *Column* rather tall, slender, 4.5 mm. high, 1.5 mm. broad, extended into a foot about 2.5 mm. long on the sides of which the lateral sepals arise ; stigma about 2 mm. long, practically whole breadth of column, rather deep ; rostellum long, conical, fleshy, almost at right angles to column, sides decurved, 2.5 mm. long ; clinandrium depressed, rather high at back ; pollinia probably ovoid and bipartite ; stalk slender, thin, curved, expanded at pollinia end, 3.5 mm. long, 0.5 mm. broad (at expanded end) ; gland apparently small. *Ovary* and pedicel indistinguishable, long, slender, 1.2 cm. long.

Chiengmai, 300 m. ; flowers white, middle lobe of lip mauve, connective dark purple ; original locality doubtful. Description from a specimen growing for some years on a tree in garden, Chiengmai, May 31st, *Kerr* 310.

***Sarcanthus flagelliformis* Rolfe mss.** [Orchidaceae-Vandae] ; a *S. filiformis* Lindl. lobo mediano elongato acuto, lobis laterali-bus minoribus haud bifidis differt.

Epiphyte, roots fairly stout, glabrous, coming off in rather a dense cluster at base ; stem long, slender, terete, specimen about 47 cm. long (not complete), distantly branched, clothed with closely adherent leaf bases ; leaf bases up to 4 cm. long, longitudinally ridged, overlapping more than 1 cm. ; internodes up to 2.75 cm. long. *Lamina* slender, terete, fleshy, curved, rounded or blunt at apex, up to 25 cm. long, 1.5 mm. diameter. *Inflorescence* lateral, breaking through vagina, rather long, slender, loosely flowered (about 17 flowers), shorter than leaves, 10.5 cm. long, peduncles short (2 cm.) with two completely sheathing bracts near base ; flower bract small, triangular, apex rounded, slightly concave, 2 mm. long, 1.5 mm. broad, 1-nerved ; flowers 8–10 mm. long. *Sepals*, posterior narrow, slightly obovate, rather deeply concave, apex rather broadly rounded, 4.5 mm. long, nearly 2 mm. broad, 3-nerved, probably somewhat fleshy, especially at apex ; lateral oblong, apex obliquely rounded, broadly attached to foot at base, 4.5–5 mm. long, 2–2.5 mm. broad, somewhat fleshy. *Petals* narrow, oblong, apex generally truncate-rounded, 4 mm. long, 1 mm. broad, 3-veined, petals and sepals all deflexed ; labellum fleshy, adnate to foot of column, conical, about 4 mm. broad (attachment to middle lobe), 5 mm. deep (side lobe to apex of spur) ; middle lobe erect, nearly 2.5 mm. long, 1.5 mm. broad at side angles, nearly 1 mm. thick, fleshy, triangular, with short, acute, fleshy side angles and long, fleshy, acute, inbent apex 1 mm. long ; side lobes triangular, truncate, with narrow fleshy projection rounded at apex projecting at right angles and curled in over mouth of spur, about 2 mm. high and nearly 1.5 mm. along apex and

horizontal projection; spur rather broad, conical, rounded at apex, grooved postero-anteriorly, slight fleshy flange on the ridges; inside at back is large fleshy, narrow callus, almost closing mouth of spur, sides of callus convex, the base expanded and fringed (nearly 1.5 mm. long and broad); the spur is divided by a septum which is continued on inside front of labellum as a ridge projecting to meet the back callus and then ending as a triangular projection just at base of mid lobe. *Column* nearly 3 mm. high (without anther), 1-1.5 mm. broad, continued into foot nearly 3 mm. long, narrow flange along column which becomes broader along foot and continues to callus and also joins to labellum side lobes; stigma large and deep seated, practically whole length and breadth of column, protected on each side by flap (1 mm. long, 0.5 mm. broad), underneath which is a bilobed process projecting from lower side of clinandrium, at base of stigma is slight cushion; clinandrium two depressed areas, wall all round, ridge down middle thick and fleshy, ending in short free narrow projection; anther triangular, somewhat depressed area in front with irregular truncate apex, 2 mm. long, 1.5 mm. broad, 0.75 mm. high; pollinia 2, irregular, flattened, almost rounded and rather deeply grooved; stalk short, broad, edges upturned meeting in a point where attached to pollinia, base broad, rounded, with erect triangular process attached (gland), 1.5 mm. long, 0.5 mm. broad, erect process 0.5 mm. long. *Ovary* and pedicel indistinguishable, 6 mm. long.

Doi Sutep, 1350-1500 m., pendulous, often growing to a length of 3 ft. on trees in either open jungle or tops of ridges; flowers sweet-scented; June 6th, *Kerr* 177.

L.—MISCELLANEOUS NOTES.

The following appointments have been made by the Secretary of State for the Colonies:—

MR. B. R. WOOD, to be Conservator of Forests, British Guiana; MR. L. J. PACKHAM, to be Inspector of Plants, Gold Coast; MR. H. S. MAGNAY, MR. F. A. MONTAGUE and MR. B. D. BURTT to be District Reclamation Officers, Tanganyika Territory; MR. K. E. TOMS, to be Horticulturist, Zanzibar; MR. J. V. R. BROWN, B.Sc., to be Provincial Superintendent of Agriculture, Sierra Leone; MR. P. C. SARBADHIKARI, B.A., to be Lecturer in Botany, University College, Ceylon; CAPTAIN W. C. LESTER SMITH, B.A., to be Inspector of Plant Pests and Diseases, Ceylon.

DR. GEORG SCHWEINFURTH.—We regret to announce the death of Dr. Georg August Schweinfurth, which took place at Schöneberg, Berlin, on September 19th. He was one of the great explorers

who in the latter half of the last century opened up the interior of the African continent and by their discoveries and experiences brought it at last within the reach of travel, science and enterprise. He was well equipped for his work from the start, and he continued to contribute to our knowledge of that section of Africa which was his special domain long after his actual work as explorer was done. In fact, his last papers "Was Afrika an Kulturpflanzen Amerika zu verdanken hat und was es ihm gab" and "Über die Wasserbauten in Aegypten" were published as late as 1922, when he was in his 86th year. Even then his interest in the botany of Africa had not come to an end, for almost up to the end of his life he made frequent visits for purposes of study to the Botanical Museum at Dahlem.

Georg Schweinfurth was born in Riga on the 29th December, 1836, where his father, a native of Baden, was in business and where he had been living since 1809. He was the youngest son of the family, and received his early education in Livonia; this he followed up by studying natural history in Heidelberg (1857-1860), Munich and Berlin. He was one of those fortunate children of genius who from the first feel their vocation, see the road to the goal, and take it forthwith with concentrated energy and unflagging perseverance. He was moreover aided by a robust constitution and untrammelled by any serious material cares. When still in his 'teens he thought of exploration and discovery in distant lands, training himself by self-imposed privation and by long and lonely tramps in his Baltic home. When a student in Germany we find him climbing in the Alps—he prided himself on having been the eighth person to reach the summit of the Grossglockner—and one long holiday was spent on an arduous collecting tour on foot in Sardinia. It was all done with the one object, as he himself says, of fitting himself for the botanical exploration of the Nile lands. At the end of the year 1863 he took a further step towards the realisation of his dream by travelling and exploring on the very threshold of the province which was to be his working field. He landed at Alexandria on the 26th December of that year and spent the next two years and the early part of 1866 in exploring the coast of Egypt and Nubia, the neighbourhood of Suakim and Kassala, the Gallabat and the Sennaar and Khartoum. For the botanist, important collections and a valuable phytogeographical sketch of the Nile region resulted from this expedition. In the summer of 1866 Schweinfurth returned to Riga. He had won his spurs as an explorer and he could now venture to solicit the support of the Berlin Academy of Sciences for his greater scheme. In this he succeeded, the Academy granting him out of the "Humboldt-Stiftung" the means for the botanical exploration of the Bahr-el-Ghazal region and for researches into the geography and ethnography of the country. He returned to Egypt in 1868 and left Khartoum for the Bahr-el-Ghazal on the 5th January, 1869, returning there on the 27th July, 1871. The work which he did in those strenuous thirty months and which carried him as far

as the Uelle beyond the Nile-Congo watershed and to the country of the legendary pigmy race, the Akkas, was well told by himself in his "Im Herzen von Afrika" which, to use Sir H. Bartle-Frere's words, "teems with observations on the physical geography, ethnography, climate, botany and resources of that remote region." It was published in several German editions (the last in 1917 and, much abridged, in 1920), in English, French, Italian and Turkish. He had the misfortune to lose his diaries, notebooks and instruments through a fire that broke out in his camp, but fortunately the bulk of the botanical collections made up till then had already been despatched to Berlin. They have been worked out since by numerous monographers and occupy, like his earlier contributions from Nubia and the Abyssinian borderlands, a prominent part in the volumes of the "Flora of Tropical Africa." Early in 1874 he returned once more to Egypt, where for many years he continued his studies and explorations, which covered not only botany, geography and geology, but also ethnography, and prehistorical research, and threw a flood of light on the fascinating problems of that country. In 1888 he settled down in Berlin—he had become naturalised in Germany in 1879—but for the next 25 years he spent the winter and spring chiefly in Egypt, except when his travels took him farther afield. These later journeys included visits to Socotra and the south coast of Arabia, east of Aden (1881), an expedition to Yemen (1889), where he followed in the steps of Forskähl, and three excursions to the Italian colony of Eritrea (1891–1894). All these journeys led to the publication of papers in various journals, among those of a botanical character the one dealing with the flora of Yemen (*Bulletin de l'Herbier Boissier*, 1894–1899) being the most prominent. Previously (1887), in collaboration with his friend Paul Ascherson, he had published an "Illustration de la Flore d'Egypte" a critical enumeration of the plants then known from Egypt with indications of their distribution and vernacular names. His large collections of plants, duplicate sets of which are at Kew, were transferred to Dahlem on the removal of the Botanic Garden and Museum from Schöneberg to Dahlem, where they formed a special department of the Museum under Schweinfurth's keepership.

This is not the place to enter into any details regarding his work in the other departments of science which he illuminated by the versatility of his genius. It has been fully appreciated in his own and in other countries, and he was the recipient of medals and honours from many learned societies. In this country the Royal Geographical Society awarded him "The Founder's Gold Medal" immediately after the publication of his book "In the Heart of Africa," and the Linnean Society elected him a Foreign member in 1887. In 1875 he was by Khedivial decree entrusted with the foundation of a Geographical Society at Cairo, whose first President he became, and in 1887 he was elected Chairman of the "Institut Egyptien" which 28 years earlier had been

called into life to revive the tradition of the institute of the same name founded by Bonaparte in 1798. As might be expected, his counsel was sought by the German Government as soon as its colonial policy assumed definite shape. He became a member of the "Kolonialrat" (1891-1908) and subsequently a member of the "Landeskundliche Kommission" for the organisation of scientific colonial exploration. More than once he was tempted to exchange his working field for another sphere of activity, but his love of independence and his deep attachment to the early scene of his labours, the "Sun-land," as he called Egypt, were too strong for him to listen to any other call.

Personally he was a man of great charm, unspoiled by the consciousness of his achievements and the fame and honours which he had received. He was gifted with a singularly broad and open mind, always displaying readiness to help and advise, and carrying a youthful enthusiasm and an untiring zest for work to the end of his life. He was sincerely attached to this country and counted many friends in Great Britain; it was not the least of the shadows which were cast over the evening of his long life that this friendship suffered, in consequence of the late war. With Kew he has been connected by correspondence since the days when he returned from his first expedition from the Red Sea, and he made numerous and valuable contributions to the Herbarium and Museum.

O. S.

Flora Capensis.—The following letters have been received by the Director and by Sir William Thiselton-Dyer in connection with the completion of the "Flora Capensis." The history of this great undertaking was given by Sir William Thiselton-Dyer in *Kew Bulletin*, 1925, p. 289.

Dominions Office,
Downing Street,
29th September, 1925.

Sir,

With reference to your letter of the 18th August, I am directed by Mr. Secretary Amery to thank you for calling his attention to the completion of the *Flora Capensis* prepared under the Editorship of Sir William Thiselton-Dyer.

The Secretary of State has written personally to Sir William Thiselton-Dyer expressing his gratification at learning that this important work, which will remain a valuable and exhaustive record of South African Flora, has been brought to a successful conclusion.

I am, Sir,
Your most obedient servant,
(Sgd.) A. C. C. PARKINSON.

The Director,
Royal Botanic Gardens, Kew.

Dominions Office,

Downing Street, S.W. 1.

28th September, 1925.

Dear Sir William,

I have just heard on my return from Geneva of the completion of the Flora Capensis, of which you have given so interesting an account in the recent number of the *Kew Bulletin*; and I write to offer you my congratulations on your accomplishment of this great undertaking.

It must be a source of much gratification to you that this important work, which has for many years engaged your attention and which will remain a valuable and exhaustive record of the Flora of South Africa, has now been brought to a successful conclusion.

Yours very truly,

(Sgd.) J. S. AMERY.

Sir William Thiselton-Dyer, K.C.M.G., C.I.E.

Botanical Magazine.—Part iv. of Volume cl. completes the volume, which is very fittingly dedicated to Lt.-Col. Sir John Ross-of-Bladensburg, whose keen interest in plants and skill as a gardener is the admiration of both botanists and horticulturists.

The following plants are figured:—*Arisaema elephas* S. Buchet (t. 9058), from North-West Yunnan; *Rhododendron Oldhamii* Maxim. (t. 9059), a native of Formosa; *Syringa Potaninii* C. Schneider (t. 9060), from S.W. Kansu; *Prostanthera rotundifolia* R. Brown (t. 9061), a native of Tasmania; *Prunus yedoensis* Matsumura (t. 9062), known only in cultivation; *Viburnum grandiflorum* Wall. ex. A. P. DC. (t. 9063), from the Temperate Himalaya; *Primula Edgeworthii* Pax (t. 9064), the plant well known under the name *P. Winteri* which is a native of the Inner Himalaya from Simla to Kumaon; *Maxillaria lepidota* Lindl. (t. 9065), which occurs in the Western Andes of Colombia and Ecuador; *Fritillaria oranensis* Pomel (t. 9066), from North Africa; *Smilax excelsa* Linn. (t. 9067), from the Orient, the shores of the Caspian to Bulgaria; *Chionodoxa Siehei* Stapf (t. 9068), a new species allied to *C. gigantea* Whittall, from S.E. Asia Minor, and *Arctotis Roodae* Hutchinson (t. 9069), a native of the Van Rhynsdorp Division of the Cape Province, Western S. Africa.

Part i. of Volume cli. (1925), which was published on September 21st, has been published for the Royal Horticultural Society by Messrs. Bernard Quaritch, Ltd., and the Society are to be congratulated on the excellence of this new Part, especially as regards the illustrations. These are produced on a good white paper and the colouring is all that can be desired. As before, the detailed drawings are excellent, and the white paper very much enhances the clearness of the detail and the value of the colouring.

The following plants are figured:—*Rosa mirifica* Greene (t. 9070), a native of New Mexico; *Dendrobium Victoriae-Reginae* Loher (t. 9071), from the Montane zone of the Philippine Islands; *Androsace spinulifera* Knuth (t. 9072), from China; *Rhododendron trichocladum* Franch. (t. 9073), a native of West Yunnan; *Staphylea holocarpa* Hemsley (t. 9074), also from Western and Central China; *Roscoeia Humeana* Balf. f. and W. W. Smith (t. 9075), from Western Yunnan; *Berberis replicata* W. W. Smith (t. 9076), from South-Western Yunnan; *Omphalodes Lojkae* Somm. & Lev. (t. 9077), a native of Alpine meadows and rocks of the Western Caucasus; *Tulipa australis* var. *arvorum* Stapf (t. 9078), a newly described variety from Algeria; *Salix Bockii* Seemen (t. 9079), a native of Western Szechuan; *Diervillea venusta* Stapf (t. 9080), a new species allied to *D. florida* Sieb. & Zucc. from Korea, and *Aster staticifolius* Franch. (t. 9081), from North-West Yunnan and adjoining parts of Szechuan.

The Flora of the Malay Peninsula*.—Under the authority of the Government of the Straits Settlements and Federated Malay States, Mr. H. N. Ridley has published in the short space of three years a complete enumeration of the phanerogamic plants of the Malay Peninsula. The sequence of Bentham and Hooker's Genera Plantarum is in the main adhered to. Each of the first four volumes includes an index of the species therein described.

The first volume is prefaced by an introduction giving information as to the area covered, the physical features of the country, the botanical divisions and also a list of the botanists who have either collected in the region or have published works on parts of the flora. A synopsis of the natural orders is then given and is followed by the descriptions of the species.

All flowering plants known to occur in a wild state as well as all established aliens, about 6000 species in all, are described. Each family and genus is preceded by a key to the genera and species respectively. The printing of the specific names in the key and in the enumeration is in clarendon type, which greatly facilitates reference. Following the name of each species in the text come references to the descriptions by King, Gamble, Prain, Clarke, Stapf, and Ridley in the "Materials for a Flora of the Malayan Peninsula." This is followed by a brief English diagnosis. The colours of the flowers and fruit which Mr. Ridley, with his long experience of the plants in the field, has been able to give, will be of great assistance. The distribution of each plant is given for the Peninsula and, when it is not endemic, its distribution in other countries is also recorded. Some 3000 species, that is, about half of the flora, prove to be endemic. Finally Mr. Ridley supplies

* By H. N. Ridley, L. Reeve & Co., Ltd., London, Vol. I. pp. xxv, 918, 1922, £3 3s.; Vol. II. pp. 672, 1923, £2 2s.; Vol. III. pp. 405, 1924, £2 2s.; Vol. IV. pp. 383, 1924, £2 2s.; Vol. V. pp. 470, 1925, £2 2s.

notes on the economic value of many of the plants and records the native names.

Throughout the work characteristic plants are illustrated by excellent line drawings by Mr. J. Hutchinson.

In the last volume there is a supplement of some 50 pages enumerating and describing specimens which were received too late for incorporation in their proper places. Accompanying this volume is a general index of the Malay plant names, and general indices of English names and of botanical names occurring throughout the publication.

S. T. D.

Nature Teaching.*—The arrangement of this fifth edition is on similar lines to the preceding, but several subjects have been introduced and the chapters generally have been brought up to date. The first four chapters treat of the various parts of the plant, and are followed by chapters devoted to the soil, plant food and manure, and flowers and fruit. Under this last heading is included a brief reference to the principles of heredity. An opportunity is taken in a chapter devoted to a discussion on weeds to give instruction in preserving plant specimens. Insects have been dealt with by Professor Ballou, and there is a brief notice on fungi and fungus diseases. In each of these chapters the subject under discussion is first described and then suggestions for practical work are detailed. The latter part of the book contains several appendices of interest; a glossary of the scientific terms used in the course of the book; tables of the common plants arranged under their principal habitats; an index to the vernacular names of plants with the botanical equivalents and habitats; a bibliography for teachers, and a list of tools and appliances required for class work. The book is intended for the senior student and the elementary and secondary school teacher. It well fulfils this purpose, and will be found of interest and assistance to teachers of nature study throughout the tropics.

We record with great regret, as this number goes to the printers, the death of Mr. J. S. GAMBLE, C.I.E., F.R.S., on the 16th October. A notice of his contributions to botanical science will appear in the next number of the *Bulletin*.

* By Sir Francis Watts. The West India Committee, 14, Trinity Square, London, E.C. 5th Ed. 1925, pp. 216, text figs. 22. Price 3s. 6d.